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### IMPRESSIONS OF DEVELOPMENTS IN RADIOLOGY ABROAD.<sup>1</sup>

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In September, 1947, I attended the Fourth International Cancer Research Congress at St. Louis, Missouri, as official Australian delegate aided by a generous donation from the American Cancer Society.

About 700 delegates attended the conference, and a heavy week of work had been arranged. Three or four scientific sessions were run concurrently and a series of exhibits on cancer treatment and research was admirably presented.

Official delegates spent much time daily in conference in an effort to put the International Cancer Research Organization on a mutually satisfactory footing. The 139 representatives from countries other than the United States included official delegates sent by their countries in response to the invitation transmitted to them by the United States Department of State and many acknowledged leaders in cancer research who had no official status. These representatives, together with those from the United States, held an organization meeting on September 2. Since the group was evidently too large to operate effectively and some nations had numerically much larger representation than others, it was unanimously decided, after full discussion, to assign the duty of making recommendations to a smaller group consisting of but one representative from each of the forty nations. This group was designated the Executive Committee of National Representatives.

The executive committee held meetings on September 3, 4 and 5. A representative from each of the three countries,

<sup>1</sup>Read at a conference of the Australian and New Zealand Association of Radiologists at Canberra from May 1 to May 28, 1948.

the United States, Great Britain and Mexico, successively presided over these meetings. The recommendations prepared were presented on September 6 in English, French and Spanish to the larger body of national representatives which established the executive committee for approval, and they were approved.

Following the formation of the International Cancer Research Commission as a component of the *Union internationale contre le cancer*, I have received notice that a meeting of the Commission is to be held at Paris in the middle of October. The organizers are anxious that Australian representation again be arranged, and hope also that New Zealand may send a representative.

In the following pages I will record some of my impressions of the work I saw either at the congress or on my subsequent visits to St. Louis, Philadelphia and New York.

#### American Committee on Growth.

An American Committee on Growth is correlating every possible avenue of research with any bearing at all on the cancer problem. All such research is being reported to it. Even isolated apparently unimportant facts are examined to see if they fit into the jig-saw puzzle. People doing similar work are brought into contact, duplication is avoided, confirmatory tests are arranged. The organization envelops biologists of all types (animal, plant and human), physiologists, pathologists, embryologists, biophysicists, biochemists, radiologists and physicists. Clinicians, surgeons or physicians attacking the cancer problem are all brought into the organization, the executive committee of which is coordinating and directing the work, sifting and dissecting the results.

#### Skin Cancer.

Cowdry and his colleagues at the Barnard Free Skin and Cancer Hospital have investigated the changes in the skins of animals painted with the carcinogen dibenzanthracene. They showed that a progressive alteration occurs in the biochemical constituents of the cell as it passes in the direction of neoplasia. A diminution of

calcium, magnesium, sodium and zinc, and an increase in the phosphorus content were observed in the cells.

It was stated that the cell surface of the squamous epithelium (of skin) contains a calcium-bearing protein which binds the cells together. It was demonstrated that the absence of this calcium protein allowed cells to break away, and thus dissemination occurred more readily. Diminution of calcium or increase of acidity in tissue fluids locally is found to alter this protein and thus affect dissemination.

It was reported to the congress that cutaneous neoplasms have disappeared in a considerable proportion of the cases treated with a protein-free aqueous extract of beef spleen injected hypodermically around the tumour.

### Breast Cancer.

#### *The Milk Factor.*

Bittner and other workers have consolidated their work on the cancer milk factor. They state that three known factors predispose to the development of mammary carcinoma in the human: (i) inherited susceptibility, (ii) hormonal stimulation, (iii) the mammary tumour milk agent. This latter agent is transferred to the suckling by milk from the mother in a few nursings. It is recoverable from all tissues (for example, liver and brain) of adult organs tested. The substance is able to be filtered and sedimented, and can propagate in the living cell; it has antigenic properties and is classed as an infective virus. Progeny of high incidence strains if breast fed by mothers of low incidence strains do not develop carcinoma of the breast. Progeny of low incidence strains if breast fed by mothers of high incidence strains do then develop carcinoma of the breast.

#### *Oestrin.*

Certain people showed examples of remarkable control of carcinoma of the breast by oestrin therapy, but the general impression is that results were disappointing.

In England, Edith Paterson has used doses of two and twenty milligrammes and finds high dosage more effective, but not proportionately so. Some palliative relief is obtained in 20% to 30% only, and not significantly more in older than in the younger patients. Those who show response all show a keratinizing reaction in the vaginal stratified epithelium, but only a proportion of those who show keratinization do show tumour recessions. The patients who do not develop keratinization do not show any tumour response.

#### *Testosterone.*

More hope is held for testosterone than oestrin. Large doses are necessary, 200 to 300 milligrammes per week for eight to ten weeks. Subjects with bone metastases derive the greatest benefit. Little recession of skin nodules has been obtained; visceral metastases occasionally show recession. But in less than 30% of cases is there any improvement, and the drug is as yet very expensive. It may cause complications of hypercalcaemia necessitating suspension of treatment, or else osteomalacia follows. Masculinization effects follow full dosage.

#### *Other Chemotherapy.*

Nitrogen mustards and other chemicals have not proved of any use in carcinoma of the breast.

#### *Trends of Radiation plus Surgery.*

In England there is an increasing tendency for surgeons to refer subjects with late stage II and early stage III tumours for full courses of radiation therapy such as is given in inoperable breast cancer (tumour doses of the order of 4000r or more). This produces a considerable reaction and subsequent scarring, but the surgeons are finding a satisfactory operation possible in selected cases. The radical operation is more difficult, but they say the improved results are justifying the increased difficulties. Previously here I have hesitated to submit these patients to surgery, and have followed with radical or local radon implant. But surgery seems now to be justified, provided that obvious permeation was not originally present, and

that the masses show local response. The radiation certainly deals with outlying cells better than central cells, from which ultimate recurrence may appear. The surgeon can remove a central tumour, but the peripheral infiltrations limit his activities. This tendency to greater cooperation between radiotherapist and surgeon is apparent also in other sites.

It is worthy of note that our emanation service in Melbourne allows a radon implant to be carried out in breast and axilla in a fashion that I did not see equalled by techniques employed elsewhere.

The work of McWhirter has caused a great deal of argument in England. He has arranged that the surgeons perform a limited simple mastectomy in cases of operable carcinoma of the breast in stages I and II. The glands in the axilla are left untouched. When the local wound has healed the anterior pectoral areas are treated between two opposing tangential fields, always placed at sixteen centimetres' separation. These fields are placed obliquely parallel to the scar and do not cover all the tissues between the midline and the posterior axillary line. The axilla is radiated by a 25 by 10 centimetre anterior axillary field. An extra supraclavicular field is added, and a posterior axillary field (15 by 10 centimetres) backs up the axillary dosage. A minimum tumour dose of 3750r to 4500r is obtained, each field receiving daily dosage over three weeks to about 4000r, which causes a uniform moist second degree reaction. Pre-menopausal patients are sterilized with a two-dose technique: 800r is administered once to an anterior and once to a posterior pelvic field to give a tissue dose of about 1000r at the ovaries. All post-menopausal patients get the same dose to their ovaries, even if seventy years old, and it is suggested that this alone often gives a very useful palliative result.

McWhirter is claiming that his results are superior to full radical operation plus the usual post-operative X-ray therapy, but, generally, scepticism is expressed and most people are continuing with the commonly accepted techniques. However, all clinicians are watching this Edinburgh experiment with keen interest.

### Carcinoma of the Cervix.

In the United States the radium work is done by the gynaecologist and only a proportion of the patients come for later external radiation therapy. The radiotherapists do not get much surgical training. There is a school growing up which is treating the primary cervical growth with X rays from a 140 kilovolt machine. The patient is positioned, a speculum is inserted under vision and is clamped in place, and then the master cone is fitted into the speculum. Regato claims very good results, and Arneson has designed a very useful couch fitting for clamping the speculum to the tube head. In principle the therapy would seem inferior to radium as no dosage whatever is delivered to the lateral portions of the pelvis.

At Manchester the radium technique has been standardized. During the war years hospital treatment was carried out at a remote centre, and X-ray therapy apparatus was not available. X-ray therapy was not given to subjects of stage I lesions, and this technique is being continued. Miss Todd has definitely shown that there is an "optimum dose" to be delivered to the cervix and its environs, and that doses larger than this optimum are just as harmful as smaller doses, either giving a greater recurrence rate than the optimum dose as determined.

Papanicolaou has caused considerable interest in his staining method for vaginal smears. He claims to be able to stain and diagnose carcinomatous cells found in these secretions often at a stage before symptoms or other clinical signs appear. It is wished to undertake mass surveys of the female population so that early cases of carcinoma of the cervix uteri may be found. He has received a large research grant for this purpose. The staining is intricate and requires special training; the diagnosis of the films also needs special skill and experience.

The method has been extended to examination of the secretions. Carcinomatous cells have been found in specimens of gastric secretion. A bronchoscopic examina-

tion may be carried out in a case of suspected carcinoma if the diagnosis is not immediately confirmed. It is becoming usual to have the secretions of right and left bronchus, or other suspected bronchiole, examined separately for the presence of carcinomatous cells. Urinary deposits have also yielded carcinomatous cells from bladder or kidney.

#### The Mallinckrodt Institute at St. Louis.

The Mallinckrodt Institute consists of a large building of seven or eight stories, situated in the centre of a group of hospitals, general, special and private. The ground floor is used for office records and finance, with every possible mechanical aid. There are three or four floors of diagnostic department; the fifth floor is used for therapy, and the upper floors for research. A tremendous array of every possible form of diagnostic X-ray apparatus is there, and no machine seems to be used for more than one form of radiational investigation. Photostat copies of all records are made for preservation. In the therapy department are one 400 kilovolt, three or four 200 kilovolt and one 140 kilovolt machines, but the department deals with only forty patients per day. The only radium work done in the department is carried out by the gynaecologist; other necessary radium work is carried out by the surgeons of the general or special units.

A. N. Arneson is the gynaecologist. Originally he worked at the Memorial Hospital and did much work on dosage distribution throughout the pelvis. He is using both intracavitary radium methods and transvaginal X-ray therapy for treating cervixes. He is a good surgeon, and has a wide knowledge of gynaecological radiotherapy. His work is recognized right throughout America.

The complete absence of effective lead protection in the theatre of the institute caused me alarm, as large quantities of radium are handled. I saw a nurse trying in vain to disentangle the threads of about thirty radium needles which had just come from the sterilizer. No leaded radium trolleys were available.

At the Mallinckrodt Institute an extensive investigation into the use of  $P^{32}$  had been carried out by the hematologists, Moore and Reinhard. Radioactive phosphorus is administered as a sodium hydrogen phosphate. The solution may be administered intravenously or by mouth with 75% effective absorption. A soft  $\beta$  ray only is emitted.

Phosphorus is selectively absorbed by the cells of the reticulo-endothelial system and by growing cells whose needs of phosphorus are greater on account of their increased nucleic acid metabolism. Unfortunately cells of active neoplasms do not absorb significant amounts.

$P^{32}$  has replaced all other forms of treatment in *polycythemia vera*, giving longer remissions and perhaps a longer life. It is of no more value in the acute monocytic leukaemias than X-ray therapy. In chronic myeloid and lymphatic leukaemia, treatment in general is as satisfactory with  $P^{32}$  as with external irradiation, though if localized or diffuse glandular or visceral enlargements are present X-ray therapy is more satisfactory. The isotope is particularly indicated when marrow failure appears with falling haemoglobin value and diminishing response to X-ray therapy. Then X-ray therapy may be more satisfactory in the early stages, the isotopes in the later stages. Hodgkin's disease, lymphosarcoma and reticulum sarcoma do not yield satisfactory results from treatment with  $P^{32}$ , though treatment with nitrogen mustards may be of assistance in later stages.  $P^{32}$  has proved of no value in treating the great group of the epithelial neoplasms, melanoma, multiple myelomata, sarcoma of bone or Ewing's tumour.

#### Philadelphia.

In Philadelphia there are four universities, each with medical schools; one is a women's college. Dr. Eugene Pendergras is chief at the University of Pennsylvania Hospital, Dr. Edward Chamberlain at the Temple University, and Professor Svensen and Dr. Lowell Erf are at the Jefferson University Hospital.

At the University of Pennsylvania Hospital I studied the uses of radioactive iodine with Dr. Dick Chamberlain

and Dr. Schiffer. Dr. Erf showed me much of his work with the blood dyscrasias in which he employs chemotherapy with mustards, radioactive phosphorus, or radioactive sodium. I have discussed the uses of radioactive iodine in another paper.

#### New York.

At New York, the Memorial Hospital staff, under C. P. Rhoads, has switched largely to a radical surgical outlook, and radiotherapy is in the doldrums. The Memorial Hospital has a huge research department with clinical research coordinated. It is not a free hospital and private bed costs range up to \$30 to \$40 per day.

The New York City Administration is building a hospital adjacent to the Memorial Hospital as a public hospital unit to be called the James Ewing Hospital, and a huge block of new buildings which will be used by the research staff and will be designated the Sloan-Kettering Institute has just been occupied.

A great deal of research is being carried out on isotopes and chemotherapy. Many varieties of the mustards are being used, firstly on laboratory animals, and then on patients. These mustard preparations are all on the secret list for security reasons, but the one most useful for clinical purposes is the product designated "bis".

At the Presbyterian Hospital, Maurice Lenz has retired as radiotherapist, but still attends for consultative purposes. Dr. Jacox is the therapist and is building up a good department, running on orthodox lines.

Mrs. Quimby, at the Presbyterian Hospital, thinks that  $Na^{24}$  is preferable to  $P^{32}$  on account of its shorter half-life of fourteen hours. It emits medium  $\beta$  and hard  $\gamma$  rays. It is not selectively absorbed by any cells and its radiation is therefore a general one. Nevertheless, it produces exactly similar therapeutic effects to active phosphorus. About 20 to 25 millicuries of  $Na^{24}$  are required to produce effects similar to those of one millicurie of  $P^{32}$ .

A very useful test has been developed for determining whether the circulation in the lower limbs is impaired. A test dose of  $Na^{24}$  is administered intravenously. The sodium is carried around the body by the blood, but some passes through the capillaries into tissue fluids and so a progressive build-up of activity occurs, for example, at the foot. This rate of build-up is increased in conditions of inflammation or vascular dilatation, and is decreased in the presence of arteriosclerotic degenerations. A normal result in the presence of obvious arterial disease indicates that effective collateral circulation has been established. In doubtful cases such a result indicates that conservative surgical procedures would be justified.

Mrs. Quimby has developed tracer tests with radioactive iodine into useful clinical tests.

The tumour conferences at the Presbyterian Hospital are featured, and are well attended by clinicians and students.

I also visited Kaplan and Rubinfeld at the City Hospital where there is a big class of post-graduate radiotherapy students.

For the board examinations of the American College of Radiology post-graduate students do a three-year course, after having done their internship in general medical and surgical practice. Two years are spent in radiology and one year in radiotherapy, but six months' part time goes to pathology. These men get no post-graduate surgical training and so are frightened to do radium implantations, that is, if they could get the radium, most of which is in the hands of the surgeons. The recurrences or necroses produced by the surgeons have brought radium therapy into disrepute. They have no clinical physicists to help them, nor have they themselves any knowledge of radium mathematics or distribution rules. The radiotherapists have a battle to fight, but I cannot see that improvement will occur until they separate radio-diagnostic from radio-therapeutic training.

Only in one hospital did I see any attempt made to think in terms of tumour dose, and all therapy is ordered on the old empirical lines. Dosage is carefully measured, but these free-in-air measurements are used for all clinical purposes and no translation into skin dose is used. No



planning of treatments, involving starting from the required tumour dose, determination of the number of skin ports available, isodosing for beam direction and then determination of the skin dosage increments, is even thought of by them. The students are aware that the British school uses these methods and calculations for radiation problems. Some of them have a smattering of Manchester rules, and I found them avid for information about the clinical uses of the system. In X-ray therapy the clinical concept of tumour dose and isodosing and dosage planning appealed very much to them.

#### Brookhaven.

The Americans have fully realized the potentialities of the artificial radioactive elements made available by atomic wartime research. The United States Atomic Energy Commission has handed over a disused army camp to a management committee, representative of nine major universities. The camp site of 6000 acres is situated sixty miles from New York City on Long Island, and contains some 300 buildings served by thirty miles of roads. Laboratories, libraries, administrative offices, a theatre, fire brigade and a local police force have been established.

In September last some 900 non-technical staff and 150 scientific personnel were working at Brookhaven. The numbers will reach 2500 in another year. It is planned to investigate the biological uses of the by-products of the atomic energy physicists and research into any aspect of the biological sciences will be undertaken. It will be equipped with a large pile, a Van der Graff generator of four million volts; and other high-voltage equipments of thirty million, seven hundred million and six thousand million volts are contemplated. An army hospital of 2500-bed capacity is on the property and will be used for reception of patients referred for investigation, research or treatment. Isotopes of short half-life will have their therapeutic possibilities tested here. Extensive physical, chemical and biological laboratories are being constructed.

A conference was held at Brookhaven in October, 1947, and physicists and medical workers attended from all over the States. The objects and aims of the establishment were explained by Dr. Morse and Dr. Sunderman, director and medical director respectively. The conference was primarily called to discuss the dangers of the isotopes, and the problems of protective measures were discussed.

The speed with which the Americans have realized the immensities of the biological problems has been matched by their material efforts to face the issues. Only in America could one see a research project initiated on such a grand scale. The greatest lesson to me was the willingness of nine major universities to sink their individualities and cooperate in the provision of administrative and scientific personnel. They have learnt their lessons of wartime, when the interaction of their scientists produced results. The lesson should be clarified to both the research and the treatment teams in our individualized hospitals.

#### Manchester.

I crossed the Atlantic and spent five weeks at the Radium Institute at Manchester. I noted a big change in the staff; with the exception of Dr. and Mrs. Ralston Paterson and Miss Todd, a completely new medical staff had been recruited. All the mould room technicians had been replaced. New buildings for therapy machines, out-patient department, and the private and intermediate in-patient block made impressive additions to the hospital's set-up.

The mould room is still the central feature of the institute. J. L. Dobbie, who developed small field beam direction radiation therapy to its present status, is missed at the institute, but his work is still carried on. Practically all deep-seated tumours are treated along these lines. Careful localization of the tumour is undertaken, the part is encased in a removable plaster shell and entrance ports are marked. The radiation beams are made to pass through the tumour and exit spots are marked on the shell. The patient is fitted in the shell during treatment, and continued accuracy of the set-up is assured by the fixed entrance and exit centerings of the beam, the back-

pointer sickle device being used. Much calculation is carried out to see that the actual dose required is delivered and that other structures do not suffer.

The amount of work entailed for the individual patient is colossal, and a large set-up is demanded, the senior and junior medical officers, mould room technician and physicist all collaborating in the calculations and design and manufacture of the patient's necessities. But the institute certainly leads the world in accuracy of planning, set-up and delivery of the stated dosage.

These schemes are applied to head, neck and thoracic neoplasms. Pelvic beam direction work utilizes external methods of beam direction and several gadgets are employed. Many gadgets of various types for beam direction are seen in the different therapy departments of England. Australian therapists lack these devices, firstly because it is difficult to fit such to the variety of machines used and therefore no single firm will make them in quantity, and secondly because workshop facilities have not been available to make the accessories. The uses of these gadgets were strikingly demonstrated to me and I feel that Australian therapists should have a supply of beam direction accessories made available.

The constantly evacuated Metropolitan Vickers 250 kilovolt deep therapy units are still in use and have done a good job. They enabled X-ray work to be carried on during the war when glass X-ray tubes would have been unobtainable.

All over Britain an extreme shortage of trained radiotherapists is noted. No juniors were trained during the war years, and with the establishment of more and more regional radiotherapy centres, all the trained men have gone off in charge of one or other institute. Thus all the senior people are worked to death, and as patients are their first responsibility, training of the post-graduate students is to some extent suffering, and discontent is expressed by them at the lack of clinical teaching.

Wartime conditions imposed great demands on available equipment at Manchester, and reversion to one-day X-ray techniques took place in an effort to cope with more patients.

At the present time many squamous-cell carcinomata of lips and skins are being treated with high dosage single techniques; even post-operative carcinoma of the breast or secondary deposits in the spine are being thus treated. I felt that this sacrifice of radiobiological principle was a retrograde step. But Paterson maintains that the records do not show any deterioration of results. Certainly, scarring is more marked, and there was a greater incidence of superficial radionecrosis last year.

Difficulties are still experienced with the radon plant, and nowhere in the world did I see plants operated with the overall efficiency of the Melbourne plants.

Meredith, the physicist-in-charge, has perfected a method of calculating isodose curves, which is regarded as more accurate than the method of direct measurement heretofore employed. Work on laminated filters for flattening isodose curves, and a method for standardizing biological dose from radium implants of varying duration have occupied much of his time.

Miss Todd is assistant director, and is in charge of the gynaecological section. Much of the gynaecological radium work is done at Baguley, an army hospital about eight miles away. Patients are brought in for daily X-ray therapy treatments. Mrs. Paterson is in charge of the research section, and has been particularly interested in chemotherapy and its problems. She pioneered the use of urethane in leucemia and recently has completed a study of the effects of stilboestrol on carcinoma of the breast. Testosterone and the mustards are also in use in the chemotherapy unit at the institute.

At the Christie Hospital in the same building a team of surgeons undertakes any general surgery of cancer. Here the neck dissections are carried out. The block dissections of the neck carried out by Mr. Douglas are a feature of the work of the hospital. If a neck dissection is required, it is a complete sweep from mandible to clavicle and trapezius, with no half-measures.



Paterson is overworked, but remains the dominant figure in British radiotherapy. His text-book of radiotherapeutic practice should be available this year. I have seen a proof copy and I can assure Australians that they will not be disappointed, and that British radiotherapy will be proud of this effort from the Manchester school.

#### Swedish Work.

Professor Berven, of the Radiumhemmet, Stockholm, visited England during my stay and addressed two meetings in London. One of these was a most informal affair at which he gave a review of the Radiumhemmet's treatment policies, and this he interspersed with many questions directed at various leading British radiotherapists, asking their views. He produced striking figures of results of treatment in many sites. A dominant feature of Swedish policy is preliminary heavy external radiation with either X-ray therapy or radium bomb. If any tumour residuum remains, massive coagulation of the area with diathermy is undertaken, whether the region is tongue or vulva. He says that this is much better than following with either further interstitial implant or cold surgery, and he certainly produced striking evidence.

#### English and Scottish Radiotherapy Services.

The English policy of centralizing radiotherapy services to population units of one to two million is steadily being carried forward. Struthers Fulton is bringing his organizing ability to work on a centre in Liverpool, where a large building is being converted to the purposes of the institute and all modern conveniences are being installed. He has seventy beds in use, and extensions to a 135-bed capacity are to be carried forward. Difficulty in obtaining English X-ray equipment has necessitated the purchase of General Electric and Westinghouse units. J. L. Dobbie is at Wolverhampton, and Charteris is at Glasgow. McWhirter has assaulted the Sassenachs with his work from Edinburgh Royal Infirmary on conservative surgery and post-operative radiotherapy in breast cancer. The Leeds and Sheffield centres I was not able to visit, but they have won recognition as first-class radiotherapy institutes.

#### Hammersmith.

I spent two weeks at Hammersmith, where the London County Council has established a radiotherapy centre for hospitals in the metropolitan area under its control. At this hospital the Medical Research Council has its Radium Beam Research Unit, and the two departments work side by side. Dr. Constance Wood is in charge here; L. H. Gray, the physicist, was busy installing an isotope laboratory and already had investigations in the uptake of  $I^{131}$  in progress in his department. He has developed a pressurized ionization chamber working at thirty atmospheres which is sensitive to one microgramme at one yard. As at other centres, his laboratory has turned out a fine range of small and ultrasmall ionization chambers with appropriate charging and measuring devices.

#### The Royal Cancer Hospital (Free).

I spent nearly three weeks at the Royal Cancer Hospital (Free). Waldron Smithers, radiotherapist in charge, has specialized in superficial neoplasms, Lederman, his chief assistant, in gynaecology and the head and neck—at first appearance a peculiar combination. Preliminary treatment planning is not so obvious here as at Manchester, but there is much more individualization of treatment, and treatment fields and total dosages are varied from week to week according to tumour response and skin or mucous membrane reactions. Lederman is most enthusiastic over his radium bombs and has produced fine figures for the treatment of laryngeal carcinoma.

The Cancer Hospital has a well-developed surgical side. It is staffed by a visiting surgical team plus two whole-time surgeons, Raven and Ledley. Raven specializes in surgery of the alimentary tract and pioneered the abdomino-thoracic approach to gastro-oesophageal neoplasms. He has developed a technique for the removal of

recto-sigmoid carcinoma with preservation of the anal sphincter.

Mayneord, their physicist, has developed a magnificent department. His workshop is presided over by the Hodts (father and son), and they have turned out a fine series of physico-clinical apparatus for precision work in applied radiotherapy. Their thimble chambers of varying sizes are the work of proven craftsmen. A measurement and experimental laboratory form one section, another is the biophysical laboratory with Lammerton in charge, an isotope section is being developed and an electronics laboratory has just been established. Mayneord was particularly impressed by the developments of electronic apparatus by the American commercial firms, and has seen the possibilities; he is doing his bit to bring into medical radiation physics the applications of this extensive field. He has found, as I have in Melbourne, that much of the calculations of routine radiotherapy can be carried out by picked radiotherapy technicians. These girls receive special training, and are able to free medical and physics graduates from a tremendous amount of routine calculation and checking.

Post-graduate radiotherapy training is taken very seriously at Fulham Road, and Professor Smithers devotes a considerable proportion of his time to clinical teaching.

The Chester Beatty Research Institute is associated with the Royal Cancer Hospital (Free) and is presided over by Professor Haddow. A big team of workers in all fields is located at this institute, and a large amount of animal experimentation is being carried out. Biochemists, led by Professor Kon, the radiobiologist Koller, and many others, are carrying out widespread but correlated investigations with the emphasis on the biochemical approach. Synthesis of many of the hydrocarbon carcinogenic substances has been carried out by Professor Kon, while Dr. Boyland has specialized in studying their metabolism.

Inspection of the research departments of such hospitals as the Memorial in New York and the Royal Cancer (Free) drives home the conclusion that isolated cancer research efforts, except in exceptional circumstances, cannot bear much fruit. The interrelationship of the processes involved calls upon highly skilled specialists in restricted fields, and only a large organization can attract and keep occupied such a team. I feel that great results are most likely to come from institutions where work is carefully planned and correlated. But this does not mean that individual problems of cancer research should not be attacked here. It does seem to indicate that the time is ripening for the establishment of a cancer research unit in Australia. To be of real value it would need a comprehensive set-up with a coordinated team of workers embracing allied scientific specialities. It would need the financial support of the individual cancer organizations of the various States if an organization of this magnitude was to be successfully maintained. It is a vision for the future.

#### Middlesex Hospital.

While I was staying in London I visited Professor Windeyer at the Middlesex Hospital and spent nearly a fortnight watching the work in the Meyerstein Institute of Radiology. The close collaboration between the ear, nose and throat specialist and the radiotherapeutic department deserves comment. A study of results of treatment of carcinoma of the larynx has convinced these workers that overall cure rates are higher with a lower incidence of post-radiation cartilage necrosis if treatment time is prolonged over a period of six to eight weeks with a tumour dose of the order of 5500r to 7000r given during this time.

#### Harwell.

The distribution of available isotopes for medical and research use is controlled from the National Medical Research Laboratories at Harwell. Dr. A. S. MacFarlane is in charge of this section, with Dr. Popjak responsible for the standardization and measurement of the samples issued for use. He has a small laboratory well fitted up to provide a high standard of safety, and his manipulation techniques, cleansing and disposal methods were impressive.

Dr. MacFarlane arranged a visit for me to Harwell, where the Atomic Energy Research Unit is situated in a disused aerodrome. A small pile was working here with a larger unit under construction. It was very pleasing to see the huge amount of constructional work that was in progress at this site. The conclusion was quickly forced upon me that the British were not sleeping upon their atomic research plans. I had a pleasant and instructive day with Dr. J. D. Loutit and Mr. Neary, the physicist. These scientists are working under the Medical Research Council. Discussions centred upon the handling of isotopes for medical and research purposes and the requisite safety precautions to be employed. These workers were most interested in the therapeutic possibilities of radioactive potassium which is readily absorbed from body fluids into body cells, but of its selective absorption little yet is known.

#### London.

The feature of life in London which is so striking to the medical visitor is the programme of meetings. Every specialist finds his needs catered for. The Royal Society of Medicine, the Faculty of Radiologists, the British Institute of Radiologists, all had arranged meetings during the time I was in England, and I found these of intense interest. Many were combined meetings of radiotherapists with physicists, with gynaecologists or with surgeons. Here one met people from all over the British Isles, and the clinicians from the distant British cities came regularly to London for these meetings—a state of affairs which did not exist to my knowledge before the war. Two unforgettable meetings were addressed by Professor Berven, of Stockholm, who visited England for a fortnight.

The Faculty of Radiologists has now its headquarters in Lincoln's Inn Fields in a building adjacent to the Royal College of Surgeons, at which it holds its meetings.

#### Acknowledgements.

In conclusion, I must acknowledge the generosity of the American Cancer Society which enabled me to visit the Fourth International Cancer Congress, and I thank the Director-General of Health for appointing me official delegate to the congress.

My sincerest thanks are due to all those workers, too numerous to mention individually, who so graciously spared their time to give me the help and advice which I was seeking on my journeyings.

## Reports of Cases.

### SPONTANEOUS RUPTURE OF A PANCREATIC PSEUDOCYST.

By THOMAS F. ROSE,

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PANCREATIC CYSTS, of which the pseudocyst is one variety, are rare (only nine cases were encountered in the Lahey Clinic from its origin in 1926 to October, 1945<sup>(1)</sup>). Consequently, rupture, especially spontaneous rupture, of a pseudocyst is very uncommon.<sup>(2,3)</sup>

Pseudocysts differ from true pancreatic cysts in that they lie outside the substance of the pancreas, usually in the lesser peritoneal sac. They have no epithelial lining<sup>(4)</sup> and there is often a connexion between the cyst lumen and the main pancreatic duct.<sup>(5)</sup>

A patient suffering from spontaneous rupture of a pancreatic pseudocyst was treated recently at the Royal North Shore Hospital and is the subject of this report.

#### Clinical Record.

The patient, a male, aged thirty-one years, had been well all his life and had never suffered any injury to his

abdomen. He had never had any abdominal pain or illness. However, he had always suffered from flatulence, especially after heavy meals.

Three days prior to his admission to hospital he noticed that the upper part of his abdomen was swollen, so much so that his clothes would not fit him. This swelling was accompanied by a constant aching pain. This lasted for two days and then the distension suddenly disappeared, to be immediately followed by epigastric pain of ever-increasing severity. In the twelve hours prior to his admission to hospital the pain was severe and he vomited several times. During this time he had considerable flatulence. The bowels were opened twice, the stools being normal in appearance.

Examination of the patient on his admission to hospital disclosed that he was breathless and cyanosed. The respiratory rate was sixty per minute, each breath being short, sharp and gasping in character. The pulse rate was 120 per minute and the temperature was 100° F. The blood pressure was 90 millimetres of mercury (systolic) and 60 millimetres (diastolic). The tongue was furred but moist.

Generalized distension of the abdomen was present, and the abdominal wall did not move with respiration. The whole of the abdomen was tender and rigid on palpation, especially in the epigastrium where the rigidity was board-like. There was dullness to percussion in the flanks, but the patient was too ill for an attempt to be made to elicit the sign of shifting dullness. No bowel sounds were audible on auscultation. Rectal examination revealed no abnormality.

The chest, apart from the rapid respiratory rate, was normal. The cardio-vascular, nervous and all other systems were normal. Examination of the urine disclosed no abnormal constituents.

Although the breathlessness and cyanosis pointed to a lesion of the pancreas, the abdominal signs seemed to be too pronounced for acute pancreatitis, and a ruptured viscus could not be excluded. Operation was accordingly performed two hours after the patient's admission to hospital.

Prior to the administration of the anæsthetic, the stomach was emptied by a Ryle's tube which was left *in situ*. A few millilitres only of normal-looking gastric contents were obtained. The patient was then anesthetized with ether by the endotracheal route after nitrous oxide and oxygen induction.

The abdomen was explored through an upper right paramedian incision. When the peritoneal cavity was opened, a litre and a half of coffee-like fluid were sucked away. (Examination later showed this fluid to have a diastolic index of 830 units. No trypsinogen or lipase was present.) No fat necrosis of tissues was present, but the bowel serosa was everywhere reddened from the irritating effect of the fluid.

A large hole was seen in the gastro-colic omentum just below the greater curvature of the stomach. This led into a large, round, unilocular cyst, whose walls were smooth, thin and friable. It was the size of a grapefruit and was securely adherent to the stomach anteriorly, and to the pancreas, the transverse colon and the mesocolon posteriorly. The pancreas was visible through the thin wall and was normal in appearance. Its consistency was also normal when it was palpated. There was no evidence of communication between the cyst lumen and the interior of the pancreas at that time. There were numerous fibrinous deposits on the wall of the cyst, and a large piece of necrotic-looking material, later shown to be fibrin, was lifted out of the lumen of the cyst.

The gall-bladder appeared normal, but contained two small faceted calculi. All the other organs were normal.

The fluid was sucked out of the cyst and the abdominal cavity as far as possible. The cyst wall was so thin, friable and adherent to surrounding viscera that removal of the cyst or its anastomosis to the bowel was prohibited. It could not be lifted up to the abdominal wound for marsupialization, so simple drainage alone was performed. A wide-bore drain was placed into the cyst through the rent in the gastro-colic omentum and brought out through

the upper end of the parietal incision. Omentum was packed round the tube in the abdominal cavity, which itself was not drained. The abdominal wall was closed in layers in the usual manner. The gall-bladder was not interfered with, as the patient's condition was not very good at the end of the operation.

During and after operation two litres of stored blood and two litres of glucose and saline solution were administered by drip transfusion.

On the following day the patient's condition was much improved. The respiration was now fifteen per minute, and no cyanosis was present. The pulse rate was 100 per minute on the average, and the temperature was normal. The tube was draining a little clear fluid only. His condition continued to improve, and the tube was removed on the eighth day after operation, as it was not draining. He was allowed up on the eleventh day and the sutures were removed from the wound, which was healed. On the thirteenth day after operation he felt some pain in the epigastrium and vomited. His temperature rose to 100° F., and a swelling was noticed deep to the upper end of the wound. At the same time it was reported that his faeces were pale, bulky and creamy in consistency for the first time during his hospital stay. They contained undigested meat fibres. Their fat content was 18.7% (a more or less normal figure), of which 55% was split fat and 45% unsplit fat, the normal figures being 80% and 20% respectively. The serum amylase index was not raised, being 28 units, but the urinary diastatic index was 100 units, the normal varying from 10 to 25 units.

The wound then discharged copious quantities of somewhat turbid-looking fluid through the site of the drainage tube. This fluid had a diastatic index of 2000 units, and some lipase and trypsinogen were found in it. It also contained some pus cells, and some Gram-negative, lactose-fermenting bacilli were grown from it on culture.

From the above observations it was obvious that there was a communication between the main pancreatic duct and the remains of the cyst, sidetracking the pancreatic juice from the bowel. This sometimes occurs in these cases, though Vecchi<sup>(6)</sup> states that it is uncommon.

The discharge lasted for ten days, during which time no wound digestion occurred. On the twenty-third day after operation the fistula closed and the faeces became normal in appearance and consistency; their split fat content had now risen to 69% of the total fat content.

The patient was discharged from hospital thirty-one days after admission. He was feeling well, and there were no signs of the cyst. Nine months later a follow-up examination showed that the patient was physically well and had had no further symptoms referable to the cyst. He was also rid of the troublesome flatulence which he had always had prior to operation.

#### Comment.

The aetiology of this cyst is in doubt. Its position in the lesser sac of peritoneum outside the pancreas indicates that it was a pseudocyst. Unfortunately a biopsy examination of the wall was not made to confirm the absence of the epithelial lining characteristic of a true pancreatic cyst. Even the true cyst, however, may have no epithelial lining, owing to the action of the ferments in its contents. Analysis of the enzymes present in the cyst do not point to its real nature, as a false cyst may communicate with the pancreatic duct as in this case.

Pseudocysts of the pancreas are usually said to be due to previous pancreatitis, or less frequently, to trauma (only one of Koucky's six cases was due to trauma<sup>(4)</sup>), but their pathogenesis is still not clear.<sup>(5)</sup> In this instance there was no previous history of trauma or infection, but there were two calculi in the gall-bladder—which, however, was normal to all outward appearance. It is difficult to see the connexion between the cyst and these calculi. Nevertheless, all authors reporting a series of these cases have stressed their association with biliary tract disease.<sup>(4)(5)(6)</sup>

The cause of the rupture of these cysts is a rise in intracystic pressure, which may be due to trauma to the abdomen (in two of Koucky's six cases<sup>(4)</sup> the cyst ruptured

in this manner) or more commonly occurs spontaneously. The rise of intracystic pressure in this case was probably due to a spontaneous hæmorrhage into the cyst lumen, which would account for the colour of the fluid and for the presence of the fibrin clot.

Koucky<sup>(4)</sup> has divided the symptomatology of these cases into three phases: firstly, the symptoms of the disease originally causing the cyst; secondly, the prodromal symptoms of the actual rupture; thirdly, the symptoms of the rupture and consequent peritoneal irritation. This patient had no symptoms attributable to the first phase except a lifelong history of flatulence. In the second phase the rise of intracystic pressure caused the cyst to enlarge, with the production of epigastric pain and swelling. The symptoms of the third phase were typically those of peritoneal irritation, with disappearance of the epigastric swelling. Two signs most characteristic of pancreatic disturbance and not mentioned in the literature of these cases were present—namely, breathlessness and cyanosis.

The ideal treatment of pancreatic pseudocysts would be complete extirpation; but this is usually impossible, owing to the nature of the cyst wall and to its adherence to vital surrounding structures. Many have performed anastomosis between the cyst wall and the bowel,<sup>(3)(6)(7)</sup> but again this can be done only in selected cases. In this case drainage was the only feasible, if not the ideal, procedure. Drainage stopped from the wound finally after three weeks and did not recur in the following nine months. In all of Pinkham's<sup>(7)</sup> ten cases, treatment by simple drainage or marsupialization was successful. Though drainage may be prolonged for as long as two years, Judd<sup>(8)</sup> points out that persistent pancreatic fistulae are not to be feared, as the absence of a lining of columnar epithelium permits the growth of granulation tissue and obliteration of the cyst.

#### Summary.

A report of a case of spontaneous rupture of a pancreatic pseudocyst is presented.

#### Acknowledgement.

I wish to thank the General Medical Superintendent of the Royal North Shore Hospital of Sydney for permission to report this case.

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## Reviews.

### INFANT FEEDING.

THERE is sound common sense as well as plenty of facts in the new edition of Dr. Vernon Collins's little book on infant feeding; and the author could claim, though he is too modest to do so, that the reader has been provided with

"Infant Feeding", by Vernon L. Collins, M.D. (Melbourne), M.R.C.P. (London), D.C.H. (London); Fifth Edition: 1948. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 8½" x 5½", pp. 98. Price: 5s. 6d.



all he needs to know on a subject of vital importance. Skill in the feeding and management of infants exceeding that of the clinic sister is expected of every doctor, and there are few fields in which a doctor's proficiency, or lack of it, is so obvious. New material in this edition includes reference to the use of protein hydrolysates, diets for the coeliac syndrome, new formulae and tables, and an excellent chapter on anorexia. The increased emphasis placed on the psychology of infancy during the past decade is reflected in the book; there is some discussion of demand feeding and a tilt is taken at "the mother so misguided as to have hired scales to make every feeding a test-feed". For artificial feeding the author inclines to the concentrated milk mixtures so popular in Victoria, in which the Calorie value of all the milk dilutions is brought up to 20 per ounce by the addition of lactose. He adds the warning, with which we would agree, that this method may be unsuitable in hot weather. The indications for and merits of all other methods in common use are also discussed.

We have nothing but praise for this short book. It continues to be well within the capacity of every student as regards cost, simplicity and reading time, and we feel sure that it will remain as deservedly popular in the future as it has done in the past.

#### DIETETICS.

ALL general practitioners will find much to help them in the solution of their many dietary problems in the little book "Dietetics in General Practice" by Leslie Cole.<sup>1</sup> Throughout the book the author adheres to common-sense principles of diet without obscuring the picture with too many ponderous details. The dietetics of maladies of all the bodily systems are discussed, as well as those of metabolic disorders, and brief mention is also made of infant feeding. It is regrettable that only four and a half pages are devoted to this last important subject and it is to be hoped that in future editions the author will greatly expand this chapter. Diabetes is treated in greater detail than any other topic and the only criticism of this chapter is that not enough different sample diets are given to enable the patient to have as much variety as is possible; perhaps this is due in part to the present-day food restrictions in England. There is no waste of space in 160 pages of this little book and it presents the basic "bread and butter" facts of the subject completely, but without the garnishings found in larger text-books.

#### DISEASES OF THE EYE.

THE appearance of the eleventh edition of "Diseases of the Eye" by Sir John Herbert Parsons and Sir Stewart Duke-Elder is rather like the welcome visit of an old and valued friend.<sup>2</sup>

The volume is bound in the familiar J. and A. Churchill manner, as heretofore, and is somewhat larger than its predecessor. However, many of the figures are "old timers"; and a number could well be eliminated and others replaced by more modern illustrations. Many of them date back to the first edition, some forty-one years ago, and obviously could be improved upon.

The authors state that "every effort has been made to retain the established character of the book as a safe, reliable . . . Introduction to the diseases of the eye for students, general practitioners and junior ophthalmic surgeons who require to know the essentials of ophthalmology and its clinical practice". Actually the book is too good, too full, too complete for students, and even for general practitioners, who would find themselves confounded by the wealth of information and detail. Indeed, the treatise could be assessed as within the category of a reference work, so full is it of original experience and sapience. With some pruning, revision and additional chapters the book could easily become a reference work of

extreme value to practising and experienced ophthalmologists. Candidates for a diploma of ophthalmology would find the book wondrously helpful and valuable.

There are a few shortcomings. Reference to the slit lamp is very meagre and an unacceptable statement is made: "the somewhat complicated technique militates against its routine use as a clinical instrument . . .". The original Zeiss instrument certainly merited this condemnation, but latter-day, especially some of the British, instruments are very simple to use, and the findings are of such ready access and of such value as to render the apparatus a *sine qua non* to intelligent ophthalmological clinical investigation. For the exact examination of the cornea, the aqueous, the iris and lens, he who familiarizes himself with the slit lamp will be the wiser and the better.

Mydriatic does not receive the stress it should—it is often the only means of fully dilating the pupil in iritis and of breaking down posterior synechiae resistant to other mydriatics.

There is so much to admire and praise that criticisms are of minor nature and importance. We hope that future editions may bring additional renown to the established reputation with which British medical publications are received throughout the English-speaking communities.

#### CLINICAL MEDICINE.

"PROGRESS IN CLINICAL MEDICINE", edited by Raymond Daley and Henry G. Miller, is a refreshing new publication.<sup>1</sup> The book abounds in up-to-date information in a compact and easily accessible form. It is a simple matter to obtain quickly reliable recent information on practically any subject. The various systems are dealt with by expert teachers and the information is clear and concise.

The book differs from those of the "Recent Advance" series in that it is an expression of modern opinion gathered in short compact sections. The cardio-vascular section contains information concerning the surgery of congenital lesions with a warning that it is as yet too early to assess the later results. There is a valuable section dealing with gout, a disease which is becoming recognized as a common clinical entity. The difficult classification of renal disease is clearly explained and reference is made to Trueta's work.

A study of this book brings one into touch with the present position of medicine in all branches without the necessity of lengthy reading. The details of treatment are naturally not included, but the broad outline is well indicated. This useful small volume makes it possible to keep in touch with recent advances with the expenditure of a minimum amount of time.

#### CLINICAL SCIENCE.

PROFESSOR R. D. WRIGHT's little brochure on "Clinical Science" aims at ensuring continuity of mental method in students passing from pre-clinical training to the bedside.<sup>2</sup> The author discusses the general features of symptoms and signs, points out the diverse conditions which may produce them, and graphically illustrates their relations to time, intensity and space. The remainder of the book follows the same philosophical method, dealing in turn with diagnostic systems, causative agents, the types and sites of lesions, the relations between structural and functional disturbances, prognosis and treatment. As a brief exposition of the logical background to clinical methods this account is sound and interesting; whether it is really meat too strong for the digestion of the clinical neophyte raises a problem in education. Perhaps the junior student in the wards will not appreciate this "cockpit drill" till he has been launched in clinical flight. A rather abstract account of method may be easier to grasp after he has built up a composite picture in his mind, and, let us hope, got himself out of mental tangles at the bedside by appeals to his pre-clinical training. Perhaps, too, if more attention was paid to the training of young clinical teachers for the responsible task of teaching, students could be spared a deal of textbook reading.

<sup>1</sup> "Dietetics in General Practice", by Leslie Cole, M.A., M.D. (Camb.), F.R.C.P.; Second Edition; 1948. London: Staples Press, Limited. New York: Staples Press Incorporated. 6½" x 4", pp. 160. Price: 8s. 6d.

<sup>2</sup> "Diseases of the Eye", by Sir John Herbert Parsons, C.B.E., D.Sc., F.R.C.S., F.R.S. and Sir Stewart Duke-Elder, K.C.V.O., M.A., D.Sc., Ph.D., M.D., F.R.C.S., Hon.D.Sc. (North Western); Eleventh Edition; 1948. London: J. and A. Churchill, Limited. 8" x 5½", pp. 740, with many illustrations, some coloured. Price: 39s.

<sup>1</sup> "Progress in Clinical Medicine", by various authors, edited by Raymond Daley, M.A., M.D. (Camb.), M.R.C.P., and Henry G. Miller, M.D. (Durham), M.R.C.P., D.P.M.; 1948. London: J. and A. Churchill, Limited. 9½" x 6", pp. 368, with illustrations. Price: 21s.

<sup>2</sup> "A Primer in Clinical Science", by R. Douglas Wright, 1948. Melbourne: Melbourne University Press. 8½" x 5½", pp. 44. Price: 3s. 6d.

# The Medical Journal of Australia

SATURDAY, SEPTEMBER 4, 1948.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

## BED REST.

BED is undoubtedly one of the most important of those havens to which we flee for respite from the boisterous wind and wave of life's open sea. Mostly we are content to put in at the end of the day and to resume our course on the morrow with greater or less enthusiasm. It has often been suggested, probably with a good deal of accuracy, that "that tired feeling" in the morning is less often an expression of physiological need for more sleep than a psychological unwillingness to leave the calm harbour for less friendly waters. Some, indeed, refuse to emerge, especially if the need for repairs or refuelling has given the human craft time to become used to quiet backwaters, and others make rapidly for harbour every time a breeze ripples the sea. However, it must be admitted that rest in bed is necessary and good in both health and disease, if taken in appropriate amounts, even though there are not lacking those who would see in the calm smile of every curled-up sleeper the carefree air of the fetus, blissful in its amniotic security.

From the therapeutic aspect, valuable and indeed essential as bed rest often is, it is probably not unfair to say that it has been regarded by many, patient, nurse and doctor alike, as something of a panacea, just as much a routine part of treatment, especially of hospital patients, as purging and bleeding were in a former day. Or it may be a matter of habit or convenience, as with the type of hospital sister described by R. A. J. Asher,<sup>1</sup> who "puts all her patients back to bed as a housewife puts all her plates back in the plate-rack—to make a generally tidy appearance". Sometimes it is regarded as an indispensable part, even the major part, of all therapeutic rest—quite a misleading view if one accepts the discussion in a leading article on rest in this journal on December 6, 1947.

Of recent years there has been a strong reaction against the immobilization of patients when it is not strictly necessary, and some revolutionary views have been put forward, ranging from the advocacy of early post-operative

activity to a reassessment of the management of cardiac disorders. Two aspects have been stressed—the lack of justification for much bed rest that has been ordered by custom only, and the positive harm that may follow prolonged immobilization. In the article already referred to, and which most of our readers will have seen, R. A. J. Asher discusses "The Dangers of Going to Bed" in an entertaining but thought-provoking fashion. With a pardonable touch of hyperbole to emphasize his point, he draws a picture of the patient who has lain long in bed:

What a pathetic picture he makes! The blood clotting in his veins, the lime draining from his bones, the scybala stacking up in his colon, the flesh rotting from his seat, the urine leaking from his distended bladder, and the spirit evaporating from his soul.

Asher hastens to admit that this is a one-sided picture and that bed rest is, of course, important and valuable; his object was to "disclose the evils of overdose". Despite this reassurance, it is difficult to avoid the feeling that Asher and others writing in the same vein have set up a Scylla to the Charybdis of harmful activity, leaving the clinician a very narrow and hazardous course to steer. It may then be helpful in getting a balanced view to turn to a recent report by J. E. Deitrick, G. D. Whedon and E. Shorr<sup>2</sup> of their investigations into the effects of immobilization upon normal men. These workers point out the sparsity of factual and quantitative data in many of the reports which condemn bed rest, and in particular the failure in many cases to differentiate under controlled conditions between the effects of bed rest or immobilization *per se* and the effects of disease. Their investigations were carried out on four normal, healthy men who were confined to bed with their pelvic girdles and legs immobilized in plaster casts for periods of from six to seven weeks. During this time, with the subsequent recovery period and during an equivalent control period of activity, extensive metabolic, physiological and "psychobiological" studies were made. It is not practicable to quote the results in detail, but the main conclusions are of interest. From their consideration of the normal subjects, Deitrick and his colleagues reached the firm conclusion that the undesirable effects of immobilization which were demonstrated are to be anticipated only in very ill patients or in those who are immobilized because of trauma, surgical procedures, poliomyelitis and similar disease conditions. They point out that only a small percentage of hospital patients are immobilized to the same degree as were the subjects of the experiment, and from the results of the study there would seem to be little danger to the average patient from unrestricted bed rest for at least the first two to three weeks. Nitrogen losses, though definite, were not heavy; changes in calcium metabolism, muscle mass and strength were not pronounced until after the first two or three weeks; an increased tendency to coagulation of the blood of the general circulation was never demonstrated. By way of comparison the results are quoted of comparable investigations by Howard of (otherwise) healthy young males who had sustained fractures. The nitrogen loss in Howard's patients was four to five times as great, and both commenced and reached its maximum much earlier than in the normal subjects. The studies on calcium loss were not strictly comparable with those in Howard's series, but it appears that the loss in normal

<sup>1</sup> *British Medical Journal*, December 13, 1947.

<sup>2</sup> *The American Journal of Medicine*, January, 1948.

subjects was at least one-half of that in patients with fractures. The urinary excretion of calcium was more nearly similar in the two series, the average maximum daily amount in the immobilized normal group being approximately two-thirds of that in the fracture group, so that the risk of formation of stone in the urinary tract appears to be similar in both groups; the urinary calcium levels do not, however, become high enough to be significant in this regard in less than three or four weeks, excepting under certain tropical conditions. As Deitrick and his colleagues point out, if the normal subjects are immobilized for long enough, not only this threat of urinary stone formation, but also impaired response of the circulation to the assumption of the upright position, derangement in creatine metabolism and accompanying loss of muscle mass and strength may become matters of real concern. For the average patient immobilization *per se* is unlikely to do harm if it is of moderate duration. Incidentally these investigations, especially those concerning basal metabolism, gave support to the opinion that bed rest is beneficial in the treatment of tuberculosis.

This study by Deitrick and his fellow workers must be assessed for what it is—a study of normal men—and the results recorded will be modified in some particular by most individual pathological states. Just the same, it helps in maintaining a temperate view in the face of sweeping generalizations. We must not underrate the incalculable therapeutic value of bed rest, though it is right that, as Asher says, it should be prescribed and not assumed. Incidentally, the old advice about treating the patient rather than the disease crops up again, for the prescription of bed rest might be right for the disease and not for the patient. Very many patients with conditions such as coronary artery disease would, if faced squarely with the issue, prefer a useful, interesting life with the possibility of an early and perhaps sudden termination to a prolonged semi-vegetable existence. There is a good deal of wisdom in Asher's variation of the old hymn:

Teach us to live that we may dread  
Unnecessary time in bed.  
Get people up and we may save  
Our patients from an early grave.

But there are many cases in which one might well further vary the last two lines and say:

Get people up and we may save  
Our patients from a living grave.

## Current Comment.

### CINCOPHEN.

ON a number of occasions in these columns reference has been made to the toxicity of cincophen and the questions have been debated whether its therapeutic use should be continued and whether its sale to the public should be controlled. This drug, also known as *Acidum Phenylcinchoninicum*, is sold under several proprietary names such as "Agotan", "Atophan", "Phenoquin" and "Tophosan". Sharply conflicting views have been expressed by those experienced in its use and such strong supporting arguments put forward that it is not easy to take up an unequivocal attitude for or against. Possibly an intelligent compromise is of more practical value and

this is supported in a recent review of the subject by W. C. Hueper.<sup>1</sup> Hueper has made a most extensive search of the literature on cincophen and its derivatives and has presented a long and comprehensive survey of the subject. He describes the history of the drug from its synthesis by Doebner and Giesecke in 1887. In 1908 it was discovered that cincophen considerably increased the excretion of uric acid in the urine and in 1911 it was introduced as a drug into medicine for the treatment of gout. Its use was then extended to the treatment of a multitude of diseases and symptoms and its sale became very great. For the first twenty years of the drug's use there is little to indicate that any serious harmful effects were observed. A report in 1923 on the occurrence of a serious complication in the form of acute yellow atrophy of the liver attracted little attention at the time and similar reports were rare. A critical attitude towards the drug gradually grew up, however, and with the reporting of deaths attributed to the administration of cincophen, abandonment of its use has been strongly advocated. Others have challenged the validity of the condemnations which do not correspond with their own observations. The practical result of the controversy has been a considerable decrease in the therapeutic use of the drug and the passing of controlling legislation, at least in certain States of the United States of America.

Hueper has set out to analyse all the available relevant data and to reach a fair and rational conclusion. The physical and chemical properties of cincophen are described with a list of related and derived drugs including their proprietary and chemical names. The pharmacological properties of the drug are considered at length and it is pointed out, and amply demonstrated by the data, that many of the most important pharmacological aspects of cincophen and its derivatives, especially its mechanism of action, are not well understood and have remained controversial matters. Careful attention is then paid to the toxicological aspects; the varying views are sifted and the conclusion is reached that, despite the existing uncertainty concerning the actual mechanism responsible for the development of acute yellow atrophy and toxic cirrhosis of the liver in the cases reported, there can be little doubt that cincophen therapy was in some way involved in the development of most of these complications. A bewildering array of contraindications to the exhibition of the drug have been put forward, but Hueper points out the slender premises on which most of them are based and doubts their real value as far as the cincophen hazard to the liver is concerned. A more conservative attitude is adopted towards the contraindications to the continued use of the drug, namely, jaundice, itching, hives, rashes, nausea, vomiting, loss of appetite, vasoneurotic reactions and similar untoward responses appearing after the administration of the drug; though the validity of every one is not proven, it is wiser to accept the warning. Measures intended to prevent untoward effects include regular testing of the urine for urobilinogen and of the blood for its bilirubin content, a system of intermittent administration to allow the liver to recover from potential ill-effects during the intervals, and a maximum dosage of three grammes per day with large quantities of liquids, sodium bicarbonate and a diet rich in carbohydrate. Hueper considers that if proper precautions are taken, the medicinal use of cincophen or neocincophen appears to be as safe as that of many other modern and valuable chemotherapeutic agents which have given rise to occasional dangerous drug reactions, and he compares it, favourably, with gold compounds. There appears to be a definite place for cincophen in the treatment of gout, rheumatic polyarthritis and other chronic arthritic conditions in which it may bring striking symptomatic relief when other measures have proved insufficient. Few will disagree with Hueper's conclusion that the use of cincophen and its derivatives for the treatment of ordinary colds, headache, neuritis, and similar conditions requiring analgesic agents, should be entirely discontinued, since the risk entailed by the disease does not justify the administration of a medicinal agent carrying with it a serious potential hazard. The

<sup>1</sup> *Medicine*, February, 1948.



continued absence of legislative control of the sale of these drugs is difficult to justify. It also seems reasonable to support his further contention, though some will continue to disagree, that the further employment of cinchophen and related drugs, with the exception of the iodine-containing compounds (whose proportionate record is unfavourable), should be retained for the management of gout, rheumatic infection, and chronic arthritis, whenever these diseases cannot be satisfactorily controlled with less dangerous drugs. The essential thing, it would seem, is that both physician and patient should be fully aware of the degree of risk involved and that due precautions should be taken. Beyond that it is a matter of balancing the therapeutic benefit to be gained and the risk to life or welfare inherent in the disease itself against the real though far from invariable toxic effects which may follow the administration of the drug. Looked at rationally the problem differs little from that presented by many therapeutic methods accepted in both medicine and surgery.

### IS RHEUMATISM A VIRUS DISEASE?

WHETHER rheumatism is a virus disease has been hotly debated at intervals since the first recognition of filterable agents below the usual limits of visibility in the production of disease. While realizing that as yet we have no complete definition of the term virus, it is necessary to define certain conditions which should be fulfilled before we assign an aetiological role to a virus. In the first place a virus is an intracellular obligate parasite, which in certain proved diseases may be demonstrated in the tissues by various methods, as the so-called elementary bodies. Secondly, suspensions of these or of infected cells should produce the specific disease on injection into susceptible animals. Thirdly, they should be neutralized by serum of individuals convalescent from the disease. Fourthly, the elementary bodies should be proved to be able to multiply.

In the examination of tissues of patients dead of acute rheumatic fever the Aschoff body with its characteristic structure is a familiar sight, but there is no evidence that the epithelioid cell, or any part of the nodule, contains material which might constitute the elementary body. In 1935, B. Schlesinger, A. G. Signy and C. R. Amies<sup>1</sup> obtained from pericardial fluid of patients with rheumatic pericarditis, small bodies which were agglutinated by the serum of rheumatic patients and not by other sera. They also obtained particles of similar refractility but varying size from pericardial fluid of non-rheumatic patients. It is to be noted that these bodies were extracellular, and no efforts were made to obtain them in tissue culture or to propagate them on the developing chick embryo. These authors were careful to state that they did not claim to have isolated a virus, or that the particles were the aetiological agent of rheumatic fever. They suggested comparisons with herpes virus during bacterial infections. G. H. Eagles and his co-workers<sup>2</sup> repeated and extended this work, using suspensions also from patients with rheumatoid arthritis and chorea as well as from non-rheumatic patients. They stated that they were able to prepare particles from all sources, and in some instances they were not able to distinguish between rheumatic and non-rheumatic preparations. They obtained agglutination with about half their sera, and some cross agglutination was observed. Eagles<sup>3</sup> administered these particle suspensions to 35 monkeys, using many different routes, and in some experiments he also injected hæmolytic streptococci, in others scarlet fever toxin. Only two of the animals showed carditis, neither developed the Aschoff body, and one of these two had received Dick toxin alone. No mention is made of an attempt to recover the particles from either of the animals. A. Claude<sup>4</sup> has performed

experiments in the preparation of tissue particles from normal animals, and has shown that by differential centrifugation it is possible to obtain suspensions which resemble closely the virus of Rous chicken sarcoma, but which on inoculation into normal birds produce no characteristic tumour.

So it would appear that in rheumatic fever the only piece of evidence for a virus aetiology is the specific agglutination of the particles prepared by Schlesinger, Signy and Amies. It is surprising therefore to read from the pen of so respected an authority as M. H. Gordon<sup>5</sup> a discussion on the aetiology of rheumatic fever in which this piece of work is accepted as sufficient upon which to base a belief and to await proof. In this country, the existence of the school of virus workers under Professor Burnet has established a highly critical attitude in the evaluation of laboratory evidence in the study of pathogenesis, and while it may well be that the factors which contribute to the development of acute rheumatic fever include the operation of a virus, Gordon has adduced no acceptable evidence that this is so. He describes experiments in which a virus first isolated from smallpox crusts was passed repeatedly through rabbit testes "to raise its potency to the full". Intravenous inoculation of this passaged material produced lesions in connective tissue around joints, but the condition could not be reproduced unless the material was again passed through the rabbit testis. When it was inoculated together with the hæmolytic streptococcus, "the virus suppressed the streptococcus altogether in the rabbit's tissues". According to an earlier statement, however, each appeared to increase the pathogenicity of the other. A strain of psittacosis virus, originally isolated from a green parrot, was passed through several mice, and then serial dilutions were inoculated into the shaven skin of a rabbit. This animal died suddenly seven days later with generalized hydræmia, and virus was recovered from spleen, suprarenal gland and nasal mucosa. The author stated that he had never met with another instance of this kind in a rabbit. These descriptions are entitled "suggestive lesions produced experimentally by viruses", but it must be pointed out that each strain was obtained from a clear-cut clinical disease, each passed through laboratory animals (known to be subject to virus diseases of their own) and each "suggestive lesion" developed in a single animal and could not be reproduced, and therefore the evidence is not valid. Gordon refers to complement fixation tests carried out in Warsaw by Dr. Brokman on normal and rheumatic sera. The antigen was a phenolized saline extract of ground up liver of a child dead of rheumatic fever, and 61 of 69 rheumatic sera showed fixation, while 49 of 51 normals did not react. Gordon rightly remarks that the preparation of the antigen deserves careful consideration—the assumption that elementary bodies should be concentrated in the liver when the visible burden of the disease falls upon the heart, seems difficult to justify. In his discussion of evidence for a bacterial aetiology of the disease, Gordon is very brief. He ignores the convincing work of A. F. Coburn<sup>6</sup> on the mechanism of rheumatic fever and its relationship to hæmolytic streptococcal infections of the throat, which is far too voluminous and detailed to be discussed here, also the interesting recent experiments of Florence McKeown,<sup>7</sup> who has produced Aschoff bodies and carditis in rabbits sensitized intravenously to horse serum. Finally Gordon's statement that "sulphonamides and penicillin do not control rheumatism" cannot be allowed to stand unqualified, in view of the excellent work in the United States by Caroline Thomas,<sup>8</sup> in the prophylaxis of recurrent acute rheumatic fever by the sulphonamides.

This problem of the aetiology of one of the most crippling diseases of childhood is far from being solved, and all the available evidence must be justly weighed, neither ignored nor over-emphasized.

<sup>1</sup> *The Lancet*, Volume I, 1935, page 1145.

<sup>2</sup> *The Lancet*, Volume II, 1937, page 421.

<sup>3</sup> *Annals of Rheumatic Diseases*, Volume I, 1939, page 19.

<sup>4</sup> *Proceedings of the Society for Experimental Biology and Medical Science*, Volume XXXIX, 1938, page 398.

<sup>5</sup> *The Lancet*, Volume I, 1948, pages 698 and 740.

<sup>6</sup> *The Lancet*, Volume II, 1936, page 1025.

<sup>7</sup> *The Journal of Pathology and Bacteriology*, Volume LIX, 1947, page 547.

<sup>8</sup> *The Journal of the American Medical Association*, Volume CXVI, 1941, page 551.

## Abstracts from Medical Literature.

### ORTHOPÆDIC SURGERY.

#### Styloidectomy of the Radius and Navicular Fractures.

L. BARNARD AND S. G. STUBBINS (*The Journal of Bone and Joint Surgery*, January, 1948) state that the observation that a normally functioning wrist joint followed wounds which caused avulsion of the radial styloid, as well as the finding of considerable displacement of the process without discomfort in fractures, led to the consideration of sacrificing it surgically. The authors consider that the presence of a radial styloid process causes some shearing stress at the fracture site in cases of fracture through the waist of the navicular. The surgical removal of the radial styloid process is presented as an aid in the treatment of malunited and ununited fractures of the carpal navicular. It simplifies the surgical approach, and ensures better visualization and immobilization of the fracture fragments, as well as less likelihood of secondary degenerative arthritic changes. If the excised styloid fragment is used for grafting material, the whole operative procedure can be confined to a single operative field.

#### Peritendinous Fibrosis of the Dorsum of the Hand.

R. E. VAN DEMARN, J. D. KOUCKY AND F. J. FISCHER (*The Journal of Bone and Joint Surgery*, April, 1948) state that in contrast to the usual traumatic tenosynovitis which responds to treatment, a painful, persistent, peculiarly hard swelling, localized over the dorsal metacarpal area and absent in the palm, may follow a blow to the back of the hand. The authors operated on two patients with this condition and found that the peritendinous tissues were hyperæmic and thickened. They consider that the presence of abundant iron pigment in the fibrous tissues, both intracellularly and extracellularly, indicates that the peritendinous fibrosis was a reaction to the absorption of blood. This focus of hemorrhage, fibrosis and scarring might well act as a source of an afferent impulse for a reflex arc involving the sympathetic fibres, to produce a secondary oedema with a neuro-vascular basis. The character of the swelling is firm and hard. In severe conditions a milder swelling appears at the borders of the hand and in the fingers, particularly on their proximal dorsal surfaces. The swelling on the dorsum of the hand persists for several weeks or months. With the swelling, an inability completely to flex the fingers occurs; in contrast, motions of the thumb are normal. Later in the course of the disease, finger motion is further inhibited by muscle atrophy and secondary contracture of the joint capsules of the fingers. After the initial injury the pain is most often dull in character, but is increased by extreme flexion of the fingers, as well as by local pressure on the dorsum of the hand. As the swelling subsides, the pain tends to disappear. There is a tendency to recurrence even though swelling has disappeared for a time. The authors state that a practical form of treat-

ment is suggested by Watson-Jones, who recommends prolonged immobilization in a dorsal plaster splint; this should be continued for several months after the swelling has subsided. Probably not all cases of peritendinous fibrosis of the dorsum of the hand have a similar basis. The hæmorrhagic type constitutes a definite subdivision of a group of ill-defined conditions which follow a definite syndrome and are resistant to the usual treatment. The presence or absence of this hæmorrhagic type should always be established before other operative procedures, such as various types of cervical sympathectomies, are performed. Permanent good results cannot logically be anticipated with cervical sympathetic procedures in those cases in which fibroblastic infiltration and fixation of the extensor tendons have occurred.

#### The Formation of New Bursæ with "Cellophane".

C. L. WILSON (*The Journal of Bone and Joint Surgery*, January, 1948) presents the gross and microscopic studies of "Cellophane" implantation into the sites of the subdeltoid bursæ of thirty rabbits, after these bursæ had been obliterated by post-operative scarring. In 23 cases bursæ of normal appearance were found. The "Cellophane" was as soft and as pliable as when it was inserted. In five cases the "Cellophane" had been rolled into a ball or a cylinder or lay in a small sack lined with a shiny, glistening wall. The sack containing the "Cellophane" lay either in the position of the subdeltoid bursa or just beneath the skin. In two cases no new bursa was found. In one of these no "Cellophane" was found; and in the other the "Cellophane" was found as a tightly coiled cylinder half extruded through the skin. Microscopically, the lining of these newly formed bursæ differed in no way from the lining of normal bursæ. There was no microscopic evidence of foreign body reaction, or of fragmentation or destruction of the "Cellophane". From these experiments the author concludes that "Cellophane" is a safe inert substance to use in the tissues. It will allow the formation of a new synovial membrane in areas where scarring is to be expected. It is quite possible that, if "Cellophane" is used in human surgery, it should be removed through a small stab incision, after the new synovial lining has formed, because the longest period of observation in the experimental animal was one hundred and forty-nine days, and it is unknown what would happen if the "Cellophane" was left in human tissues for years.

#### Habitual Dislocation of the Shoulder.

H. OSMOND-CLARKE (*The Journal of Bone and Joint Surgery*, February, 1948) describes the operation for dislocation of the shoulder developed and performed independently by Putti and Platt about 1925. The principle of the operation is to suture the distal end of the divided subscapularis tendon to the cartilaginous remains on the glenoid surface. This provides a primary barrier to redislocation of the head forwards and inwards under the subscapularis. The medial portion of the capsule is strained outwards to overlap the tendon of the subscapularis, giving a "double-breast coat" effect. A further overlapping—"an overcoat"—is

provided by suturing the muscle belly of the subscapularis to the scarified tendinous cuff which overlies the greater tuberosity, or the bicipital groove. This causes shortening of the subscapularis, which, however, must not be overdone. The author states that the operations which achieve the most consistent results in the treatment of the habitual dislocation of the shoulder are those which produce a block to the exit of the head in front—a block of tight capsule, of fascia, of scar tissue, or of bone. The Putti-Platt procedure offers the further safeguard of shortening the subscapularis muscle which in most cases results in permanent limitation of external rotation movement. Unless these movements can be forced to their full range, and even beyond, dislocation cannot occur.

#### Excision of Patella for Recurrent Dislocation.

B. McFARLAND (*The Journal of Bone and Joint Surgery*, February, 1948) states that he now regards removal of the patella as essential in "realignment" procedures undertaken for treatment of recurrent dislocation of the patella. When suturing the capsule and ligaments after removal of the bone, he takes care to direct the pull of the strong outer portion of the quadriceps tendon to the inner side of the *ligamentum patellæ*, and it may well be that it is this precaution which prevents recurrent displacement. In no case has there been recurrent slipping of the tissue which forms in place of the patella. From observation of patellæ removed—one even at the early age of eight years—he believes that retropatellar chondritis is due to the recurrent dislocation, that it is present before any operation is performed, and that it progresses inevitably to osteoarthritis. It follows that any primary operation other than patellectomy must give rise to late osteoarthritis.

#### Injuries Caused by Parachute Jumping.

R. CIOCONI AND R. M. RICHMAN (*The Journal of Bone and Joint Surgery*, January, 1948) describe a series of 3000 fractures and major soft-tissue injuries resulting from parachute jumping. Almost all injuries involved weight-bearing structures. The distribution and patterns of injury were generally similar to those encountered in civilian orthopaedic practice; yet there are certain minor statistical differences which are related to the peculiar stresses of parachute jumping. No injury is specific enough to be called a typical parachute lesion. Four basic traumatic mechanisms are described: torsion plus landing thrust, which is the most common mechanism of injury and is responsible for a chain of related injuries, extending from the toes to the hip; backward landing, which results in vertebral compression fractures and head injuries; "opening shock", which causes many ligamentous tears and even fractures of the extremities; violent vertical landings, which cause severe multiple fractures of the legs and spine. One-half of all parachute fractures involve the ankle mortise. The most prevalent mechanism of injury is external rotation which, together with abduction, accounts for approximately 75% of fractures at the ankle. The entire lower extremity shows a preponderance of external



rotation injuries. This would imply a structural weakness of the limb as a whole—a lack of adaptive resiliency to the stress of external torsion. The authors consider that a classification of fractures based on aetiological stresses is much more reasonable and useful than one based on anatomical location. Recognition of the aetiological stresses not only relates apparently dissimilar fracture patterns, but also provides a rational approach to treatment.

#### Plantar Digital Neuritis.

K. I. NISSEN (*The Journal of Bone and Joint Surgery*, February, 1948) presents a series of cases of Morton's metatarsalgia in which 27 patients have had 35 operations on the sole of the foot. At operation degeneration around the plantar digital artery to the cleft between the third and fourth toes was found to precede the fibrous thickening of the nerve described by Betts in 1940. Similar changes rarely occur in neighbouring clefts. The author states that local resection of the nerve almost always gives complete relief from pain, and the plantar scar gives rise to no trouble. Histological findings show that the nerve lesion is ischemic in nature. He states that the syndrome of plantar digital neuritis is a distinct clinical and pathological entity. In this series acute pain was almost entirely limited to the sole beneath the necks of the third and fourth metatarsals and the entire surface of the corresponding toes. The pain is typically neuralgic, usually relieved by resting with the shoe removed, but in severe conditions pain sometimes continued through the night with much loss of sleep. Usually the feet are normal in formation, but they may be associated with *hallux valgus* and anterior flat foot. The most constant sign was pain on firm upward and backward pressure in the sole just distal to the third and fourth metatarsophalangeal joints. In one patient a swelling was palpable. Diminished sensation to pin prick in the cleft between the third and fourth toes was occasionally found, and when present was the most valuable of all signs.

#### PÆDIATRICS.

##### Radiography of the Gastro-Intestinal Tract in Infancy.

MILTON G. WASCH AND ABRAHAM WARCK (*The Journal of Pediatrics*, May, 1948) have investigated the X-ray appearance of the alimentary tract in newborn babies in an effort to assist in the early diagnosis of congenital obstruction of this tract. They studied fifty babies at various intervals during the first day of life. The babies were given glucose and water by mouth eight hours after delivery, and subsequent milk feedings at four-hour intervals. The authors state that air in the stomach immediately after birth has been shown to be a constant finding. At the end of one hour it had passed into the upper part of the small bowel to form a discontinuous pattern in seven of the ten babies examined at this interval. These air-filled loops of small bowel were in the left half of the abdomen. Between one and three hours after birth the air became distributed throughout the small bowel, and after the third hour every child examined showed air in the colon, at

first in the ascending limb, then in the descending limb, and after the eighth hour in the sigmoid colon and rectum in most cases. The transverse colon was usually not visualized. The authors report two cases of congenital obstruction of the bowel in which radiology helped to establish the diagnosis. One baby vomited at the eighteenth hour of life and the abdomen became a little distended. Two hours later X-ray examination revealed a normal stomach, the small bowel distended with air, but no air in the large bowel. Operation revealed atresia of the small bowel at its mid portion. A second baby in whom vomiting occurred after its first feeding was not submitted for X-ray examination until thirty-six hours of age, when greatly distended loops of small bowel with fluid levels were visualized in the left part of the abdomen, but no air was seen in the colon. Operation revealed atresia at the jejuno-ileal junction.

##### Treatment of Pink Disease with BAL.

LEE BIVINGS AND GEORGE LEWIS (*The Journal of Pediatrics*, January, 1948) report a case of acrodynia (pink disease) treated with British anti-Lewisite (BAL). The treatment arose from the observation of Josef Warkany, who had found mercury in the urine of children suffering from pink disease. An estimation of mercury in the urine of this patient was made and revealed 100% per centum. The treatment with BAL caused a steady decrease in this figure and a corresponding rapid improvement in the manifestations of pink disease. The author suggests that this observation is worthy of confirmation and investigation.

##### Congenital Coxa Vara.

F. C. GOLDING (*The Journal of Bone and Joint Surgery*, February, 1948) states that it is known that the upper shaft of the congenitally short femur, which appears to be absent, is actually formed in cartilage, though imperfectly. The radiographic appearances in later life depend upon the extent to which this cartilage is converted to bone—a process which is often incomplete in the femoral neck and sometimes in the subtrochanteric region. In early months radiographs show only the lower part of the shaft of the femur; there is no evidence of the upper part of the shaft, neck or upper femoral epiphysis. The upper part of the femoral shaft then ossifies, but it is not until some time later that the upper femoral epiphysis appears, leaving a broad band of cartilage in the region of the epiphyseal line. The author states that the development of separate areas of ossification within this zone of cartilage gives an appearance of "fragmentation" which has sometimes been mistaken for osteochondritis, and for the appearance of "triangular fragments", often described in the lower part and sometimes in the upper part of the femoral neck, which are of no particular importance. Final ossification of this region is very delayed, weight-bearing meanwhile causing deformity or even complete solution of continuity. A second area of imperfect and delayed ossification may also be found below the trochanters where the shaft is frequently thin but sometimes dense, and the differentiation of medulla and cortex is imperfect. Weight-bearing may cause deformity or solution

of continuity at this level. The authors state that the final results of attempting to walk on the defective support of imperfectly ossified areas of cartilage are varus deformity of the neck, varus deformity of the subtrochanteric region of the shaft, beaking of the greater trochanter by muscle tension or cartilage and soft bone and usually increased shortening of the limb. The appearances are very variable because the condition develops slowly over many years; in some cases the deformity is bizarre; but all the features may be explained by the theory that congenital coxa vara is the final form of the congenitally short femur.

##### Benzedrine in the Treatment of Epilepsy.

SAMUEL LIVINGSTONE, LASLO KADJI AND EDWARD W. BRIDGE (*The Journal of Pediatrics*, May, 1948), working in the epilepsy clinic of the Johns Hopkins Hospital, have investigated the use of benzedrine and its dextro-rotatory component, dexedrine or d-amphetamine, in the control of epileptic seizures. The drug was tried on 89 patients, most of whom were children. In 38% the seizures were controlled and in a further 20% improvement was noted. Much better results were obtained with *petit mal* than with *grand mal* seizures. In some cases phenobarbital therapy was continued while the benzedrine was given, and the results obtained were just as satisfactory. Improvement in mood, optimism and willingness to work have been reported by various authors as a result of the use of benzedrine as well as of other anti-convulsants in the control of epilepsy. The levorotatory component of the drug had no anticonvulsant power. Minor toxic reactions, insomnia, tremor, weakness and irritability were usually controlled by decreasing the dosage. The dosage of benzedrine sulphate varied from five milligrammes to 45 milligrammes daily and of dexedrine sulphate from 2.5 milligrammes to 15 milligrammes a day, divided throughout the day, the last dosage seldom being given later than 4 p.m.

##### Osteomyelitis in the Newborn.

CHARLES G. HUTTEN (*The Journal of Pediatrics*, May, 1948) states that there has been a tendency to regard osteomyelitis in the newborn as a benign disease, with comparatively little constitutional disturbance, little destruction of bone and excellent bone regeneration and final function. However, he believes that some babies died of staphylococcal septicæmia with bone and joint involvement in the years before penicillin was available. Those who recovered had a relatively benign illness, with excellent bone regeneration and good final function. However, since penicillin has been available most of the babies with the more severe infections are surviving; bone and joint damage is sometimes great and permanent, and the ultimate deformity is considerable. The author considers that osteomyelitis in the infant should not be considered a benign disease, that all minor infections of the newborn, especially omphalitis, infection of the skin or of a circumcision wound, or staphylococcal nasopharyngitis, should be considered precursors of severe infection and treated intensively, and that every effort should be made towards early diagnosis and control of the blood stream infection and of the bony lesion.



## Public Health.

### A CONFERENCE OF RADIOLOGISTS.

A CONFERENCE of the Australian and New Zealand Association of Radiologists, called by the Commonwealth Department of Health, was held at the Institute of Anatomy, Canberra, from May 24 to May 28, 1948.

#### Opening Address.

The opening address was delivered by SENATOR THE HONOURABLE N. E. McKENNA, Minister of State for Health and Social Services, DR. A. J. METCALFE, Director-General of Health, being in the chair.

Senator McKenna outlined the role that the Federal Government had played in relation to health and medical services since federation, with particular reference to work carried out in radiology and allied fields. He discussed what had been achieved in regard to the control of tuberculosis and the plans for the future. He referred to the increased powers recently acquired by the Federal Government in relation to social services and the Government's intention of instituting a Commonwealth medical service. He said that he could see radiology as a vital part in that service and was sure that it would be generally agreed that the benefits of radiology should be available to everyone. There might be differences of opinion as to how that could be brought about, but the details could be the subject of further discussion at the appropriate time.

DR. VAL McDOWELL moved a vote of thanks to the Minister for his attendance and address and mentioned that the conference was the first gathering of radiologists at which those interested in both the diagnostic and therapeutic aspects of the subject had been brought together. It was, in effect, a continuation of the cancer conferences held prior to the recent war.

DR. F. A. MAGUIRE, in seconding the vote of thanks, said that he was attending the conference, not only as a foundation member of the association, but also as regional chairman of the Royal College of Obstetricians and Gynaecologists. He would like to have seen representatives of the other royal colleges also present. He mentioned the Minister's reference to new methods introduced into medicine through radiology and suggested that a new era in medical work might be beginning in which the radiologist would lead. Dr. Maguire then referred to the importance of a national research university, but said that effective research was not just a matter of governmental support and money. The research worker's attitude and hard work were what mattered. Such people as the Curies and Banti had achieved much under very adverse conditions. The other absolute essential for effective research was freedom—freedom to think and to work, freedom from direction and controls. It was in that spirit of freedom that the conference was meeting.

Senator McKenna, in reply, said that the speakers' remarks were quite sufficient to make him feel that his visit had been worth while. If the conference could put forward any recommendations along the lines that he had already mentioned, they could be sure that the recommendations would receive the fullest consideration and sympathy.

#### The Urinary Tract.

DR. COLIN EDWARDS read a paper on methods of radiological diagnosis in urology illustrated with X-ray films. With the intention of exciting discussion on urographic technique in infants and children, he first presented a series of films illustrating the following congenital anomalies: retention of urine due to stenosis of the external urinary meatus of a two-year-old boy, urinary obstruction caused by a congenital valve of the posterior part of the male urethra, acute retention of urine due to obstruction by a retroperitoneal dermoid cyst in a girl, and double kidney with a ureteric orifice opening into the urethra in two female children. Diagnostic methods included cystography, retrograde pyelography and excretion pyelography in which the contrast medium was injected subcutaneously.

Dr. Edwards commented that cystography was a valuable method of diagnosis in children as no anaesthesia was required and it caused no systemic disturbance. He also expressed the opinion that the capacity of the modern cystoscope was evidently not fully appreciated; it was quite practicable to prepare retrograde pyelograms in a male child of the age of four months and at a much younger age in the female.

Discussing urograms, Dr. Edwards said that the difficulty of obtaining readable urograms in children was notorious, partly owing to the rapid excretion of urographic media, but mainly on account of gastric and intestinal distension. The latter, he believed, was often due to crying from hunger, fright or pain when the injection was made. He described the subcutaneous injection technique designed to avoid the difficulties mentioned. On the previous evening a mild aperient was given and half a grain of "Nembuta" orally (for a child aged one year). One feed was omitted immediately preceding the X-ray examination. One hour before the injection one grain of "Nembuta" was administered rectally. After the taking of the first flat picture, 20 millilitres of the opaque medium diluted with 80 millilitres of saline solution were administered subcutaneously. A weal was first raised in the skin over each scapula with local anaesthetic solution. A fine two-inch needle was inserted on each side. When five millilitres of the preparation had been injected the needle was partly withdrawn and reinserted at a different angle. The process was repeated on alternate sides until the 100 millilitres were used. The child was then nursed and was often asleep before the first exposure was made ten minutes later. The technique, Dr. Edwards said, had given more satisfaction than intravenous or intramuscular methods in infants, but it was by no means completely successful and any suggestions would be appreciated.

Dr. Edwards then went on to show films illustrating other methods of diagnosis which appeared to him to be used less frequently than their value warranted. The first group showed the advantage of pneumopyelography over routine retrograde chemopyelography in investigating suspected transradial calculus or tumour of the renal pelvis. The next film indicated what Dr. Edwards considered was meant by the term "nephrogram" and that to which the term should be restricted, namely, increased density of the renal shadow in intravenous urography due to selection of the contrast medium by the tubules, but failure to excrete it into the pelvis because of obstruction.

Two films illustrated the importance of withdrawal of the ureteric catheter to the lower third of the ureter before completion of the instillation of the pyelographic medium. Another film was of a patient who had recently passed a stone from a right ureterocele into the bladder: a transparent halo surrounding the terminal portion of the ureter filled with "Perabrodil" was diagnostic of ureterocele, the only possible fallacy being a stone in a diverticulum which also contained tumour or urine; secondly, the ureter was full from top to bottom, though evidently the significance of the physiological fact that that could not be normal was not always appreciated.

Dr. Edwards then presented some typical films of urethrograms and pointed out that the urologist wanted information from urethrograms regarding (i) any unusual configuration of the bladder neck, such as intrusion of intravesical prostatic lobes, or a funnel-shaped internal urinary meatus; (ii) elongation of the posterior urethra; (iii) atonicity of the external sphincter; (iv) normal dilation of the bulbous urethra; (v) false passages, fistulae, diverticula; (vi) anterior urethritis.

In conclusion, Dr. Edwards said that generally the urologist's objective was to obtain the maximum information possible and then to perform a prearranged operation with as little impromptu surgery as the case permitted. If there were better methods or if more information was obtainable they wanted to know about it.

DR. ALAN OXENHAM discussed radiological diagnosis in relation to the urinary tract. He confined his remarks to the radiology of renal tumours and explained that, although from a pathological aspect the term tumours of the kidneys referred to neoplasms, from a radiological point of view a wider classification was necessary embracing macroscopic enlargements of the kidneys and adrenals; the basic problem was the discovery and differentiation between the various enlarged masses which occurred in the renal areas.

Dealing first with neoplasms, Dr. Oxenham said that they might be divided into those arising in the parenchyma and those arising from the renal pelvis and calyces. He described the pathological and radiological features of each type of neoplasm in turn. Basically neoplasms arising in the parenchyma, by compression of the cortex, thinned out and elongated the infundibula of an affected portion into slender tubes as the growth progressed. If the tumour was confined to a single pole then only the infundibulum in that region was involved. If the process was general, affecting the greater portion of the kidney, a "spider-leg" deformity was seen. That appearance was not distinctive of any particular type of tumour, as it depended merely upon the actual

compression of the tissues by a newgrowth. Benign neoplasms of the renal parenchyma, including adenoma, lipoma, fibroma and angioma, seldom caused notable symptoms apart from the severe hæmaturia which might arise from an angioma. Hypernephroma (Grawitz's tumour) and embryoma (Wilms' tumour) were the most important neoplasms of the renal parenchyma. Hypernephroma, a renal carcinoma arising either from adult tubules or from islets of nephrogenic tissue which had persisted in the renal cortex, was the commonest type. Its radiological signs were (i) the "spider-leg" deformity, (ii) encroachment on the renal pelvis of varying degree, (iii) secondary pyelectasis, (iv) displacement of the renal pelvis, (v) deformity and displacement of the upper portion of the ureter, (vi) displacement of the kidney, and (vii) displacement of adjacent organs. Embryoma, a teratoid or developmental neoplasm, was the most common malignant tumour of early childhood. Its radiological signs consisted in the pressure distortion of hypernephroma without the invasive tendency. There was considerable temporary response to irradiation. Metastases, though uncommon, might occur in the lungs.

Amongst tumours of the renal pelvis, Dr. Oxenham said that papilloma arising from the epithelium of the pelvis and calyces was not uncommon; hæmaturia was the outstanding symptom. Radiologically a filling defect was observed which varied with the shape and size of the papilloma; this might be accompanied by varied degrees of hydronephrosis. Malignant neoplasms of the pelvis were mainly papillary in macroscopic appearance with similar radiographic findings to those just described. A non-papillary or squamous infiltrating form was rare. There was gross obstruction of the renal pelvis and hydronephrosis was often appreciable. Tumours of the pelvis were rarely large enough to cause great enlargement of the kidney, as symptoms (and so as a rule diagnosis) were early. Tumours should not be confused with non-opaque calculi, varicosities, blood clots and air bubbles.

Dr. Oxenham then discussed other conditions which had to be excluded in the diagnosis of a mass in the renal area. These included congenital lesions, such as horse-shoe kidney, unilateral fused kidney and accessory lobe of the kidney; cystic lesions, such as polycystic disease, solitary cyst, multiple cysts, hydatid cysts and dermoid cysts; infective lesions, such as carbuncle of the kidney, perinephric abscess and renal tuberculosis; ruptured kidney, and adrenal neoplasms.

Dr. D. G. MAITLAND described investigations that he had carried out, especially from the radiological aspect, into the changes which occurred in the urinary tract during pregnancy. A paper on this work will be published in detail at a later date.

Dr. KEITH HALLAM asked Dr. Edwards if there was any danger associated with the preparation of pneumopyelograms. He agreed that the diagnosis between hypernephroma and congenital cystic disease of the kidney might be difficult radiologically. He said that he wished to protest against the inhuman way in which retrograde pyelography was sometimes carried out: urethral catheters were inserted blindly in the operating theatre and the patient was taken off to the X-ray department for the instillation of the opaque medium, the urologist leaving the whole procedure to people who knew little about it or about the dangers associated. Most radiologists found the investigation of renal disease intriguing and they liked to see things done properly. If they could persuade hospital authorities to remedy the practice that he had described, it would be worth while.

Dr. JOHN O'SULLIVAN asked for further information regarding nephroangiography, as his own experience of the procedure had been disappointing.

Dr. F. A. MAGUIRE commented on Dr. Maitland's idea that hypertrophy of the ureter might be due to humoral influence associated with a common embryological origin of the urinary and genital tracts. He was doubtful that that could be so, as the two tracts developed from two different embryological structures and the gonads from a third. He discussed possible hormonal influences and suggested that if the hormone concerned was chorionic gonadotropin the effect would be seen in great degree in the presence of hydatidiform mole and that that would be worth further investigation. There might be other hormones, not yet described, in the placenta which caused those important effects. With regard to Dr. Maitland's observation that a constriction of the ureter had been seen in patients in the preeclamptic state, Dr. Maguire suggested that other radiologists should follow up that observation and that if they found anything of significance they should advise Dr. Maitland.

Dr. Edwards, in reply, said that pneumopyelography had been used only to a limited extent because it was difficult

to reproduce the pictures satisfactorily in a text-book and the procedure had not become well known. He had never seen a fatality during a long practice of the method, nor even any pain. It was difficult to instil sufficient air to make a good picture, especially for a bilateral pyelogram, and he did not consider that there was any risk of air embolism.

Dr. Oxenham thanked the speakers for the appreciation of his paper.

Dr. Maitland thanked the speakers for their remarks and said that his embryological theory was but a theory and that his knowledge of embryology was much less than that of Dr. Maguire. He would appreciate any information sent to him regarding constriction of the ureter and hydatidiform mole.

### Hyperparathyroidism.

Dr. E. R. CRISP read a paper on hyperparathyroidism in which he discussed the subject from the historical, clinical and radiological aspects, with particular reference to blood chemistry, and presented a review of the relevant literature. This paper has been published elsewhere.

Dr. BARBARA WOOD presented the case histories of six patients, treated at the Royal Melbourne Hospital during the past fifteen years, who had had parathyroid tumours removed as treatment for hyperparathyroidism. In all six cases the diagnosis was made from X-ray appearances which showed the characteristic changes of generalized *osteitis fibrosa cystica*. Presenting symptoms and signs included widespread aches and pains accompanied by stiffness and weakness, pathological fractures, severe pain localized to a swelling in the thigh, and a large lump on a tibia of a patient who had previously undergone nephrolithotomy. Five of the six patients were females. Their ages ranged from twenty-one to forty-five years, but one of them first attended at the age of sixteen years.

Commenting on the clinical histories of the patients, Dr. Wood said that, although stressed by many writers as frequent symptoms of hyperparathyroidism, polyuria and polydipsia had not been prominent symptoms in the series reported. Tetany was not troublesome after removal of the tumours. In four of the six patients the tumour could be felt in the neck before operation. Calcification occurred in the kidneys of three patients; this did not lessen after operation. The bones showed improvement after removal of the tumours, but it appeared to be a very gradual process, and long after a successful operation the internal bone architecture remained abnormal, although the density in X-ray films might be quite good. Deformities, of course, persisted.

Dr. R. KAYE SCOTT discussed tracer tests that had been carried out by means of the small amount of radioactive iodine available in Melbourne. He also referred to the treatment of hyperparathyroid tumours; secondary deposits were irradiated with a small tumour dose repeated over a long period. No very significant suppression of the blood calcium level had been observed, but it could not necessarily be said that there had been no local effects. Further radioactive iodine tests would be carried out at the first opportunity.

Dr. H. R. SEAR referred to changes seen in renal rickets, similar to those in hyperparathyroidism.

Dr. DOUGLAS GALBRAITH referred to a patient, an infant, with a pathological fracture of the femur which had been diagnosed by radiology. He said that exploration was to be made of the neck and if necessary of the mediastinum. The child's excretion of calcium was very high. Dr. Galbraith had been administering aluminium because of its high phosphorus-combining power. He asked whether the use of isotopes in tracer diagnosis helped in the location of the parathyroid glands and also if any alternative treatment could be suggested for his patient.

Dr. H. A. MCCOY asked if any routine attempt was made to localize the primary tumour, if any helpful evidence could be obtained from routine X-ray examination of the chest, and if use had been made of any excretory substance to localize parathyroid tissue.

Dr. J. A. VOTE said that in the presence of bilateral ureteric calculi in young people with no previous history of fracture *et cetera*, hyperparathyroidism should be considered. He described a patient with ureteric calculi who was found to have a stippled vacuolated appearance of his bones. The findings on blood examination were typical and a parathyroid tumour was subsequently removed.

Dr. B. P. ANDERSON STUART said that the condition was appreciated in X-ray films when the diagnosis was known,



but he wondered if the diagnosis would be made from a single film seen during a busy afternoon. It was necessary to study individual lesions in individual bones, and if any changes were detected other bones should be examined.

Dr. Crisp, in reply to Dr. Sear, said that at first it might not be possible to differentiate between renal rickets and hyperparathyroidism radiologically; further investigation would be needed. In reply to Dr. Galbraith he said that no therapy would be of any use. In reply to Dr. McCoy he said that he had had no experience of any method that would help in the localization of the tumour and that no suitable excretory substance had so far been found. In reply to Dr. Vote he said that a large number of cases at the Mayo Clinic had been detected from renal tract changes.

Dr. Wood thanked the speakers for their remarks.

#### Lipiodol in Diseases of the Nasal Sinuses.

Dr. R. M. GLYNN read a paper on the use of lipiodol in the diagnosis of chronic uncomplicated infection of the antrum. He stated that although the diagnosis of acute infection of the antrum and of cases associated with polyp or gross pus in the nose was easy, there remained a large group of cases in which diagnosis was difficult. A large number of those cases were due to allergy rather than infection, and he felt that the radiologist was seldom justified in using the words "indicating infection" in his report in this type of case, as he could not as a rule distinguish between allergy and infection.

Dr. Glynn analysed a group of 150 cases in which a report of mucosal thickening had been obtained. In 108 of these a negative result was obtained from washouts, and in 42 a positive result. Seventy of the patients with negative results from washouts had lipiodol injected into their antra through the inferior meatus of the nose; in 28 cases there was a filling defect, and in 42 no filling defect. Twenty of the patients with positive results from washouts had lipiodol injected into their antra through the inferior meatus of the nose, and in all cases there was a filling defect. If in the same proportion of those with negative results from washouts who had not had lipiodol injected into their antra filling defects occurred, it followed that about two-fifths of those with an initially positive X-ray result had neither a negative result from a washout or a filling defect, and he felt that those patients could be regarded as normal.

The patients who had negative results from washouts, but in whose X-ray film a filling defect occurred, included a number with allergic conditions, and from Dr. Glynn's point of view an important question was the differentiation of the group with conditions due to infection from the remainder. He felt that the use of contrast media had helped him both in diagnosis and in deciding what operation to perform.

Dr. H. A. MCCOY said that a review of the patients whom they had examined after injection of maxillary antra with lipiodol had disclosed a few findings which they felt might be worth while recording at a meeting such as the conference. The patients examined by the method were chosen because the evidence of the plain film was suspected. The technique had been varied during the course of the investigation in an attempt to decide how many extra exposures were desirable and in what positions, having in mind practical and economic restrictions. The work had been carried out as part of their routine investigation of the patients injected with lipiodol and there was no intention that it should be presented as a complete investigation of the method. They were indebted to Professor Abbie for placing at their disposal a selection of dried skulls and thanked members of the radiological department at the Royal Adelaide Hospital for their cooperation in preparing the slides.

Dr. McCoy showed a series of slides and said that the slides which he and Dr. Glynn described were intended to emphasize the following points: (i) that it appeared to them that injection with lipiodol was a useful adjunct in the X-ray investigation of maxillary antra; (ii) that examination by injection of the suspected antrum furnished a more direct approach to the problem than did the information furnished by the instillation method of Froetz; (iii) that they were impressed with the fact that interpretation of plain X-ray films of the antra was probably subject to error in a significant percentage of cases; (iv) that they believed that the term "suggestive of thickened mucosa" should be used conservatively and only after critical review of all the facts.

Dr. VAL McDOWELL described his experiences while working with the late Dr. Graham Brown, who made it a practice to compare his pre-operative radiological diagnosis with the findings at operation. Dr. Graham Brown had used lipiodol, but considered that use of the medium made interpretation more difficult than when it was not used.

Dr. B. P. ANDERSON STUART said that he accepted the criticism made regarding diagnosis, but considered that the radiologist should be allowed to suggest the presence of infection when there was gross thickening of the mucosa to the density of bone. He was not impressed with the use of lipiodol, but if it was used the X-ray picture should be taken soon after the plain X-ray picture because of the changes which took place with the lapse of time.

Dr. J. A. VOTE said that he agreed with Dr. Anderson Stuart. The radiologists were to blame for the situation because they had built up a high standard in some things and the same standard of accuracy was always expected. They were asked to pull a diagnostic rabbit out of a hat with no hat and no rabbit. He found that he was not often able to see fluid levels and could not be sure if pus, infection or fluid was present. He often felt quite humble in relation to the diagnosis of various other conditions of the sinuses and considered that an attempt at exact diagnosis was wrong and was leading radiology into disrepute. He described experiments carried out on the skull in which mobile small lead shot was introduced into the sinuses. X-ray examination of the skull was performed in different planes and it was surprising how often lesions were obscured by the opaque medium; there was also little benefit from injection of the sphenoidal sinuses. He considered that the contrast medium, air, which was already there, was quite sufficient. He said that in the case of frontal sinusitis only the diagnosis might be made of infective lesions and osteomyelitis. The radiologist was a fool if he attempted to perform the impossible. Dr. Vote said that he had three children with sinusitis; sometimes X-ray examination showed their sinuses completely dull with the appearance of pansinusitis, and three or four days later they were practically clear. The best results were to be obtained by careful and routine examination of plain radiograms.

Dr. JOHN O'SULLIVAN said that the work described was to be commended, but personally he had been disappointed with the method, though it had a definite value with certain indications. He doubted if the method provided any more information generally than careful routine X-ray examination. He had found tomography to be of value.

Dr. DARCY COWAN described the results of the routine examination of the chests and sinuses of 200 students at the University of Adelaide in three years. X-ray examination had thrown doubt on the condition of the sinuses in 60% of cases. Clinical examination had suggested involvement in only 10% of cases and the two groups had not always coincided. Because of the confusing results routine examination of sinuses had been dispensed with. The majority of the 60% mentioned had had no symptoms that could be related to sinusitis. The diagnosis of sinus trouble was not straightforward and any additional methods were worth considering.

Dr. D. G. MATTLAND asked Dr. Glynn if treatment of chronic antral infection by means of inductotherm and the intramuscular injection of penicillin was of any value.

Dr. KEITH HALLAM said that cooperation demonstrated by the speakers between the ear, nose and throat surgeon and the radiologist was ideal, but the use of lipiodol was not necessarily so. He asked if lipiodol had been instilled into antra after antrostomy.

Dr. Glynn, in reply, said that he had not set out to be critical, but that he had been faced with many dissatisfied patients. Many patients refused to have anything done to their antra. Whatever methods were right or wrong, the present methods were not satisfactory and the subject demanded further study. He said that he had instilled lipiodol after antrostomy, but the lipiodol ran out; the only way would be to fill the antra when the patient was on the X-ray table. He had not been impressed with penicillin in treatment, but for a certain group inductotherm and penicillin were useful.

Dr. McCoy thanked the various speakers for their remarks.

#### Miniature Radiography and Mass Surveys.

Dr. H. W. WUNDERLY said that the time had come when they should take stock of the present position of mass radiography as it was the basis and most important part of a case-finding programme. He quoted at some length from correspondence regarding a proposed nation-wide survey by means of mass radiography of the chest in the United States to show that the problems there were much the same as those in Australia and the solutions offered were similar to those recommended by the standing committee on X rays of the National Health and Medical Research



Council, whose consolidated report was then in the hands of the printer. Dr. Wunderly quoted the report as saying that miniature radiography served to select those cases in which there were suspicious chest shadows; direct radiography on full-sized films then followed, and, if necessary, clinical and bacteriological examinations. The committee viewed with alarm the indiscriminate use of X-ray equipment for mass survey purposes by bodies which had not the necessary staff and organization to deal with the problems of detection of tuberculosis and of direction of patients requiring treatment. The committee stressed the importance of using qualified radiographers specially trained in miniature radiography and recommended that each batch of miniature radiographs be examined independently by at least two competent interpreters (one being a radiologist) and that in all cases in which any one examiner was suspicious, investigation by direct radiography be carried out. Classification of appearances in miniature films should be limited to "normal", "probably abnormal" and "technical fault", and in the last two cases there should be further investigation. The description of direct radiographs should be limited to the confirmation of the presence of an abnormality, a statement regarding its topography, diagnostic probabilities and a recommendation for further investigation. To assist in obtaining uniform standards of interpretation the committee recommended the establishment of a library of films.

Referring to the size of miniature films, Dr. Wunderly said that the use of 35-millimetre films had been recommended by the standing committee on X rays before the dollar position became acute. He quoted the American conclusion that, apart from minor factors, no method, not even the use of 14-inch by 17-inch films, was superior for case-finding purposes to any of the other methods, and the statement that disagreement would result from trying to get too much information from an X-ray film; if they tried to make a bacteriological diagnosis from an X-ray film they would get into trouble.

Dr. Wunderly said that if there was to be a Commonwealth-wide plan for the control of tuberculosis he would like to see mass or group surveys conducted amongst certain groups (others could come later): (i) in-patients and out-patients of all hospitals; (ii) contacts, domestic and other, of all known subjects of tuberculosis; (iii) food handlers, hairdressers, barmen; (iv) working miners and all who were receiving pensions or compensation for silicosis; (v) all who were exposed to dust hazards in industry; (vi) teachers, lecturers and scholars in schools and universities; (vii) patients of private practitioners.

In conclusion, Dr. Wunderly said that it would be some years before they could have much in the way of new buildings for new or enlarged radiological departments and some time before they had many more adequately trained radiologists and radiographers, and it might be difficult to procure much new modern apparatus. But the work was there to be done and he asked for the radiologists' assistance in developing some workable plan by which they could better handle an increased load of X-ray examinations.

Dr. R. M. DE LAMBERT described his experiences in mass chest radiography, with special reference to the use of "non-screen" film and high peak kilovolt technique, while conducting the radiological and clinical work of a mass radiography unit in Sydney. The primary object of the work was tuberculosis case-finding, but where possible complete radiological, clinical and bacteriological investigation was made of those presenting initial radiological evidence of any thoracic disease. The equipment used, which Dr. de Lambert described in detail, allowed for the rapid preparation of large numbers of miniature radiographs, but was not satisfactory for full-sized films. He considered, however, that reexamination by means of a full-sized film, where indicated, should be part of the initial survey. Individually wrapped "non-screen" films had been used for that purpose and had proved entirely satisfactory.

Dr. de Lambert discussed the technique of preparing "non-screen" films and said that, as far as he knew, the work represented the first extensive use of "non-screen" films in chest radiography; between 4000 and 5000 radiographs had been prepared by the method over a period of eighteen months. He pointed out that a chest radiograph on "non-screen" film had many qualities not found in the conventional "screen-film" radiograph. The immediate reaction of one accustomed to the latter type was not favourable; the radiograph appeared undesirably "flat" and lacked the high contrast favoured by many. On closer inspection it was found to possess a wealth of detail and sharpness not possible of achievement with screen techniques. The relatively lower contrast factor or greater latitude of the "non-screen"

film had an inherent advantage in the case of the chest, for its significant structures from a radiological point of view in "survey" films included tissues having a very wide range of absorption coefficients or relative "transparency" to X rays. They ranged from the heart and mediastinum at one extreme to the most transparent portion of the lung field at the other. Moreover, an area of even lower transparency, for example, a tumour, enlarged auricle, or collapsed lower lobe of the lung, might overlie the shadow of the heart and mediastinum, whereas an area of emphysema might lie in the peripheral lung field. Either of these should be recorded on the film.

Dr. de Lambert said that for a radiograph to be correctly interpreted, the densities of the images of all significant structures needed to be approximately proportional to the actual "density" of those structures to X rays, and that would be so over a limited portion of the characteristic curve of the film used; no significant image should lie in the region of under or over exposure of the film if it was to be observed and interpreted correctly. The characteristic curve of "non-screen" film being much more gradual, it had much more room on it for the widely spread intensities of radiation emerging from the irradiated chest. Furthermore "non-screen" film made use of the lower values of E which were lost with screens. It was thus possible to see the outlines of the vertebral bodies through the mediastinal shadows and still display an area of emphysema at the periphery of the lung field.

Other features of the work to which Dr. de Lambert referred were the use throughout of a high, fixed, peak kilovoltage, which made it possible to "see through" the ribs, and the use of a fluorescent screen having its maximum emission in the blue-violet region of the spectrum and of a film of similar sensitivity.

A clinical follow-up had been made in all cases when significant radiographic abnormalities had been found; fluoroscopy, bronchograms and X-ray examination of the nasal sinuses had been made use of and, if tuberculosis was suspected, the tuberculin test was carried out and examination made of sputum and/or fasting gastric contents for tubercle bacilli. At least a provisional diagnosis was made and advice given and recommendations made regarding treatment or further observation. The patient was then referred either to his own doctor, a chest clinic or a general hospital, or discharged, as was appropriate. The patient was asked to nominate a private doctor, who was kept informed of results of investigation, the patient being encouraged to consult him. Few general practitioners had, however, shown any interest or appreciation.

Dr. de Lambert said that it was uncommon to find, even among medical practitioners, an accurate appreciation of the present indications for, and limitations of, mass chest radiography. Laymen and public bodies had false ideas which often led to mistaken activity. X-ray examination of the chest of everyone over the age of fifteen years appeared theoretically desirable, but was impracticable. It was practicable, however, to examine selected groups in two categories: firstly, groups known to contain a relatively high proportion of subjects of pulmonary tuberculosis, and secondly, self-contained groups within industry.

Dr. J. S. Verco said that of the problems associated with mass chest radiography the first was one of organization. A mass survey was usually started by some public-spirited body which wished to do good, or to gain publicity by good works. At that stage the radiologist should be available to advise as to broad principles and to assist in the formation of the policy to be adopted. The policy should be such that a smooth-running scheme would operate. The scheme should not operate till it was ready. Failures were to be avoided. If no radiological advice was available from that stage on, enthusiasts would rapidly devise wonderful unworkable schemes which were doomed to continuous trouble. In Dr. Verco's opinion some public or charitable body should deal with finance, provide labour and organize the attendance of persons to be examined at the times that were required. The radiologist should advise on what type of equipment was required, and where considered advisable share that responsibility with other radiologists, and if necessary with the Commonwealth X-Ray and Radium Laboratory, which he had found most helpful. The radiologist could be a part-time adviser to the organizing body, but he must be very firm to see that his advice was accepted and acted on, and he should be in control of all technical directions to all technicians and clerks immediately concerned in the X-ray examination. He should see that he had a good team of technicians and clerks and ensure that conditions of pay and work were satisfactory and that adequate protection from the radiation was provided.

The second group of problems were those at the site of examination. The site might be permanent or altering. Adequate floor space and good electric supply were necessary, as also was a regular flow of examinees. Developing and interpretation of films should be done at some central city depot. Floor space should be arranged with a small assembly hall, undressing cubicles for both sexes, controlled doors of access to the X-ray hall, and dressing cubicles and exit, to ensure a steady flow of the stream of the examinees through the department. The apparatus should be placed in such a position that the beam of X rays was directed away from the clerks and protective screens must be provided. A check should be made for scattered radiation during the first week of a new set-up and thereafter at monthly intervals. A transportable X-ray apparatus, cubicles and partitions, and transportable dark room could be loaded on a lorry, moved from place to place, and set up within two days. It was important to use an apparatus capable of energizing a rotating anode tube and having an adequate photo-electric timer; the latter provided for uniformity of results. Examinees should be transported from an outlying locality to a more suitable locality; this was more economical if an appointment system was used.

Dr. Verco then described the system of handling examinees which in part solved the problem of identification and simplification of clerical work.

A direct radiograph film, if necessary, was taken, the same number being used as on relevant micrograph films; cassettes with intensifying screens were used and films were changed in a portable dark room. Dr. Verco pointed out that direct radiographs taken without screen and with the use of the photo-electric timer were of sufficient diagnostic quality, but they lacked the contrasting appearance that the majority of general practitioners were used to dealing with. For that reason it had been decided to instal an independent timer and take direct radiographs using intensifying screens and produce a film of the type normally in use for forwarding to the patient's doctor.

The third problem related to processing and interpretation of films and distribution of reports. A central processing depot had been established, as it was anticipated that films coming from several areas would be better dealt with on account of more suitable dark-room facilities, faults of production of films could be more easily assessed and better supervision would be obtained.

Each spool was then arranged with cards and application forms under the supervision of a trained nurse who marked any form mentioning a history of previous illness, which might be relevant. The reading of films was carried out through a direct viewer by a radiologist skilled in interpretation. The interpretation was only to discover abnormality or probable abnormality; if such was found a large film was directed to be taken. When the film was considered to be normal or to have no evidence of disease which needed further investigation, the examinee was advised from the central depot. When an abnormality or probable abnormality was reported a letter to the examinee from the central office requested attendance for further X-ray examination.

When large films were examined and no abnormality was found the examinee was advised accordingly. When the presence of an abnormality was established its topography and diagnostic probabilities were described; if the abnormality was in no way relevant to pulmonary tuberculosis a letter was sent to the examinee advising that examination had revealed no abnormality that required further investigation, but that the report would be of interest to the examinee's medical adviser to whom it would be forwarded if the examinee desired.

If the report revealed a pulmonary condition which might be tuberculosis, a letter was sent to the examinee strongly advising further investigation by his own doctor, and on receipt of the doctor's name the direct radiograph and report were sent to the doctor.

Dr. Verco said that in the scheme there was and must be a place for the physician, pathologist and family doctor, the health authorities and the radiologist; the family doctor to initiate the examination, the physician and pathologist to clinch the diagnosis and the presence of infectivity and to direct treatment in difficult cases, the health authority to aid in following up examinees, especially those who did not attend a doctor, and also the doctor who did not carry out reasonable examinations, and the radiologist who must see that from the inauguration of the scheme to the issuing of the final reports nothing but the best service was good enough.

Dr. Verco gave a demonstration of the application forms, identity and report cards used in the scheme and the direct viewer for examining microradiographs.

DR. KEITH HALLAM expressed appreciation of the work that Dr. Wunderly was doing and the gratification of radiologists that he held the position that he did. Dr. Wunderly had brought mass radiography of the chest to Australia in 1939. He was a good physician with the right personal qualities and was the right man to bring together the various diverse aspects of the subject. Dr. Hallam said that mass surveys had to start in some way and in many cases they had started in the wrong way. He referred to the terms "over-reading" and "underreading" which had a very specific meaning in radiology. The first referred to the seeing of pathological changes which were not there and the second referred to failure to see pathological changes which were there. The terms were likely to become catchwords and wrong meaning to be read into them; they might thus be used as derogatory terms. That possibility should be combated. Dr. Hallam said that he was greatly taken with the films demonstrated, but they must be presented with the right light, namely, an exceptionally strong light, the sky without the sun being really the best. The portability and convenience of the mass radiography films were much in their favour.

DR. J. N. BURGESS said that the subject appealed to all because they had seen the tragedy of tuberculosis. Radiologists had a unique opportunity to lead the way in one of the biggest preventive measures of the day. Opposition was met with, even amongst radiologists, but, as had been said, the size of the film which was often the ground of opposition did not matter. Opposition was also experienced from the general public, especially from certain employers. Dr. Burgess described his experience with mass radiography in Williamstown and in Brunswick and Coburg. He said that it was desirable to try to cover definite age groups, for example, children leaving school, hospital patients and private doctors' patients. He felt that in mass surveys the mobile unit would play the main part, for example, by visiting such places as factories.

DR. B. C. DEANS recalled an experience at Heidelberg Hospital when he had checked the microradiographs of known tuberculosis subjects and had got someone else to check his results. The microfilms had been remarkably faithful with few exceptions. In an appreciable number of cases there was clear evidence that a lesion which brought a patient to hospital and which was gross could not be seen in a microradiograph six months before. He referred to the selection of special groups which was aimed at finding and isolating infectious conditions. Selection was very important and concentration should be made on groups in the population which were likely to contain the greatest number of open and infectious cases of tuberculosis.

DR. L. HENZEL criticized the practice of using the word "active" or "inactive" in X-ray reports on tuberculosis, despite the fact that experience showed that activity could not always be determined from the X-ray film. As one who had organized public health work, he had found that the biggest problem was associated with handling the patient after the X-ray examination. The best advice and the highest order of efficiency were desirable in preparing and reading the X-ray film, but the subsequent investigation was most important. To deal with that problem the organization of laboratory services was necessary. He referred to the letter described by Dr. Verco, which advised the patient to see his own doctor, and said that the average doctor in practice had neither the means nor the knowledge to handle such patients. He submitted that that could only be done where facilities were adequate. It was dangerous and wrong to hand the patient over to the doctor who was not fully qualified to handle the condition. It was also important that radiologists should have a knowledge of the clinical point of view and should have access to clinical and laboratory findings when assessing the X-ray evidence. It was not wholly true to say that only radiologists could interpret X-ray films of the chest; those who were constantly dealing with patients and contacts had had great experience. The radiologist was a key man in the team for handling diseases of the chest, but he should have contacts with the others in the team.

DR. T. L. TYLER said that the radiologists and physicians must insist on the best quality for mass examination. He referred to Dr. de Lambert's opinion that surveys of school children were futile and described an examination made of 500 school children, in which cases of bronchiectasis, pulmonary abscess and hydatid disease were found. He considered that such examinations should be chest surveys and not tuberculosis surveys.

DR. C. E. EDDY referred to Dr. Verco's statement that the appearance of a radiograph must be interpreted in terms of illumination and the eye. He pointed out that the only instrument used by the radiologist was the eye and that that



fact was usually overlooked. The best conditions for the eye to react to should be provided, both in relation to the X-ray film and its illumination. He thanked Dr. de Lambert for the stimulus he had provided; the idea of the non-screen film was a novel one. The first films had not impressed photographers, who had brought forward what they considered to be good films, but Dr. Eddy had come to the conclusion that the X-ray photographer was like the society photographer who liked to produce a good picture, but such a picture did not always resemble the original object. Dr. de Lambert's work was getting away from old ideas with the object of allowing things to be seen better.

Dr. W. P. HOLMAN said that Dr. Wunderly had made a revolutionary statement that had gone almost unnoticed, namely, that the authorities said that all films should be looked at by qualified radiologists. He referred to the difficulty of getting doctors to enter the field of diagnostic radiology because there was no inspiration towards that provided in the medical schools. Dr. Wunderly's object could not be achieved unless something was done in the matter and the Association should take an interest in it.

Dr. F. A. MAGUIRE discussed the administrative point of view, based on his experiences while he was director-general of army medical services. The object of an anti-tuberculosis campaign was to detect tuberculosis early, isolate the patient with an advanced lesion and ultimately to eliminate the disease. Dr. Eddy had referred to the importance of scientific standards to be adopted; Dr. Maguire said that the body to insist on those was the Australian and New Zealand Association of Radiologists, who must be the advisers. It was necessary that the most efficient machines and the best films and the best conditions for preparing the X-ray films should be provided. After the reading of the X-ray film, the patient must be followed up by the physician and the laboratory, but the radiologist would remain in the forefront. The ultimate solution lay in teamwork, but the greatest responsibility rested on the radiologists.

Dr. F. V. MUNRO asked whether, in the event of many cases of tuberculosis being detected, the work would be futile and whether Dr. Wunderly could say that beds would be available for those patients.

Dr. DARCY COWAN said that mass radiography must be the basis of case finding. Dr. Wunderly's programme was a good one, especially in regard to the selection of subjects for examination. He remarked that mass radiography was good, but that it caused some headaches; they were now getting patients so early that they did not know what was wrong with them. The problem of the minimal lesion was a difficult one; it did not always turn out to be evidence of active tuberculosis. Commenting on Dr. Henzel's remarks, he said that great difficulty in determining whether a lesion was active was experienced by everyone and not only by the general practitioner. The intelligent general practitioner would refer for further opinion patients in whom the diagnosis was difficult. He considered that it was important to keep the general practitioners on their side.

Dr. R. D. MCINTOSH referred to the campaign being conducted in Tasmania, where 70,000 persons had been examined out of the total population of 150,000 persons over the age of fourteen years. They had found that three persons per 1000 were in need of immediate treatment. A booklet was issued to all individuals who visited the mobile X-ray plant. He advocated that facilities should be available at the mobile unit to follow up the use of the miniature film by the fourteen-inch by seventeen-inch film, especially in the country.

Dr. Henzel said that he would like to correct the impression that he thought that the general practitioner should be short-circuited. In Western Australia the patient was offered an alternative of attending the clinic or his own doctor. The doctor, when consulted, usually preferred the clinic to carry on with the patient's care. The point was that the doctor had not the means to deal with the situation; those had to be created and offered to him.

Dr. Keith Hallam said that his experience was that the general practitioner would have very little to do with patients with tuberculosis. He wondered whether the appropriate government department should not take over the management of the patients or attempt to interest the general practitioners.

Dr. Wunderly said, in reply to Dr. Holman, that he would like to emphasize the fact that the radiographers were to undergo a long period of training. To Dr. Tyrer he said that the children under the age of fifteen years referred to were a somewhat selected group. The intention of the present survey was to locate the infective lesion in order to

stop further spread and to detect the preinfected lesion to prevent it from becoming infective. A survey had been made in the United States of 80,000 children under the age of fifteen years, and it had been considered that the survey was not worth the money and trouble expended. In reply to Dr. Munro, he said that the attempt was to locate infective conditions, irrespective of whether beds were available or not; at least they could be taught how not to infect others. Many could be nursed at home with the assistance of public health nurses. Dr. Wunderly considered that beds in sanatoria could be used more economically. Many such beds were occupied by those who could derive no benefit from sanatorium treatment. With regard to the minimal lesion in the absence of symptoms and in which an occasional tubercle bacillus was found as a result of gastric lavage, he considered that it was safe for such a patient to continue working, provided that he was kept under observation.

Dr. Verco, in reply, said that the days of the projector had gone, the direct viewer now being used. The letter to which he had referred was not an original one; the idea had been used elsewhere. He considered that the general practitioner had to be kept in the picture. Public health bodies should be able to exercise some control over the general practitioner if necessary.

Dr. de Lambert, in reply, stressed the futility of a tuberculosis survey of school children. With regard to the follow-up procedure after mass radiography, he had tried to steer a middle course. Investigations were carried out, but the patient's own doctor was informed of all the details and advised if further follow-up was needed. The patient was sent to the general practitioner without being excluded from the opportunity of making use of the services of the clinic.

#### The Physical Aspects of Radiology.

Dr. C. E. EDDY discussed recent developments in the physical aspects of radiology.

Dr. B. P. ANDERSON STUART said that he was particularly interested in what Dr. Eddy had said about advances in diagnostic methods; it was necessary for radiologists to put those into effect. Inadequate methods were still in use, especially in many hospitals, and radiologists at hospitals should work to have improvements made.

Dr. VAL McDOWELL asked Dr. Eddy if the formula  $\frac{V^2 IT}{D^2}$  still held.

Dr. KEITH HALLAM said that the words overreading and underreading should be interpreted in terms of innate physical factors and not of personal factors. Radiologists should be employed where they were best fitted to be. In mass surveys they should be tested as to their physical ability to estimate shadows.

Dr. J. STAPLETON asked if there was any plan whereby physicists would be available to aid the therapist in his plan of treatment more than at present.

Dr. J. B. McMIKEN asked if there were any possibilities of the use of higher frequencies as in industrial radiography.

Dr. SYLVIA BRAY asked Dr. Eddy for more information in regard to protection on walls and ceilings.

Dr. D. G. MAITLAND asked how the testing of photographic units could be arranged.

Dr. JOHN O'SULLIVAN said that the X-ray and radium laboratory in Melbourne had a keen staff from the director downwards, but that their equipment and facilities were in inverse ratio to their keenness. It was necessary to emphasize to the Commonwealth health authorities the importance of doing something about it. He suggested that they should go into the matter at the general meeting.

Dr. W. P. HOLMAN said that Dr. Eddy's team were the best people to put operational research into effect. He supported Dr. O'Sullivan in his remarks regarding the laboratory in Melbourne, the scope and work of which was much greater than it had been designed for. He considered that Australia had something almost unique in the world in that institution and the radiologists should nourish it.

Dr. Eddy, in reply to Dr. McDowell, said that the law of photographic response  $\frac{V^2 IT}{D^2}$  occurred in manufacturers' books, but not in text-books of physics. It was only an approximation and might be responsible for some of the radiographer's problems. With regard to operational research, he said that the war had interrupted plans for the advance of the physical services and shortage of personnel existed. Young graduates did not always appreciate the



importance of the medical aspects of physics. In reply to Dr. McKen, he said that there was not much use for high-frequency equipment, but that it might be used to obtain a picture of a stationary heart; the time of exposure was about one-thousandth of a second. In reply to Dr. Bray, he said that the amount of protection on walls could be worked out; it was just a mathematical problem. The four walls and ceiling might all have different thicknesses; each had to be considered on its own merits. In reply to Dr. Maitland, he said that the graticule could be sent with the necessary instructions to wherever it was required. There was no desire to centralize the testing in Melbourne. In conclusion, he referred to the fact that a lot of the work described was not his own but that of his fellow workers.

#### Developments in Radiology Abroad.

DR. R. KAYE SCOTT read a paper entitled "Impressions of Developments in Radiology Abroad" (see page 253).

DR. C. DE MONCHAUX suggested that there might be some intimate relationship between carcinogenesis in the skin and calcium metabolism. There was some support for the theory and he thought that it should be a subject for research. He commented that McWhirter's work on carcinoma of the breast was revolutionary. He considered that the important question to be considered was whether the technique prolonged or shortened the life of the patient.

DR. H. J. HAM said that he was acquainted with McWhirter, whose work had been going on for seven or eight years. McWhirter's procedure consisted of simple operation plus radium therapy and he claimed that his results justified it. Dr. Ham remarked that if that was true, the whole treatment of carcinoma of the breast would be changed.

DR. W. P. HOLMAN expressed the opinion that McWhirter's work would need very careful analysis before being accepted. He referred to his own experience of the use of stilbestrol in a small number of cases with a dramatic response; all the patients were elderly. He had also used testosterone, but the expense involved had prevented the use of large doses. He remarked on the notable improvement in the general condition which occurred, even though metastasis was still going on.

DR. A. J. CAMPBELL said that he had treated a small series of patients suffering from inoperable carcinoma of the breast with large doses of irradiation and had then referred them back to the surgeon; all were still alive. Of a series of patients not referred back to the surgeon some had died. He considered that it was well worth while to have the surgeon remove the residuum.

DR. A. M. JOHNSON asked if any information could be given on the treatment of skin carcinoma by the injection of spleen and liver extract.

DR. C. E. EDDY said that anything which had been accomplished in the provision of radon services in Australia was due to his predecessor, Mr. Turner. He could not understand why the service was not known overseas and even in Australia. He considered that a library service was required as much scientific literature was overlooked.

Dr. Kaye Scott, in reply, said that there was a lot to be said for surgical removal of the residuum, provided that there was no danger of stimulating the spread. It was of no use to cure the disease and kill the patient. With regard to McWhirter's work, one must wait and see the results. Dr. Scott said that he had been disappointed with the results of the use of stilbestrol and thought that he had seen stimulation of the growth occur in patients around the age of the menopause. He considered that testosterone should be available in adequate doses for the treatment of selected subjects and that its use should always be accompanied by adequate investigation. He had not been impressed with the treatment of skin cancer by protein-free extracts. He considered that a library service was very important, as most practitioners were too busy to keep up with the literature and needed help.

#### Radioisotopes in Treatment.

PROFESSOR P. MACCALLUM and DR. KAYE SCOTT read papers on the use of radioisotopes in treatment. Dr. Kaye Scott particularly emphasized the importance of adequate care and protective measures in the handling of radioisotopes.

DR. C. E. EDDY supported Dr. Kaye Scott's remarks on the importance of adequate protective measures. He said that probably hundreds of people in Australia had applied radium or radon, but that very few of those people had seen radium salt or solution. In the case of the isotopes, they would be dealing with material which was not hermetically sealed and much greater care would be required. He viewed the matter

with some trepidation and remarked that, although the properties of radioactive material had been appreciated early in the century, a large group of girls had been killed in the nineteen-twenties because of lack of precaution in handling radioactive material. He was grateful to Dr. Scott for bringing the matter forward.

#### The Treatment of Superficial Skin Lesions.

DR. C. F. DE MONCHAUX, in a discussion on pigmented skin lesions, benign and malignant, said that the benign pigmented lesions of the skin included the fairly common pigmented moles, warts and papillomata; the malignant pigmented lesions constituted the so-called melanomata. At the outset, it was most important to distinguish between quiescent and active growths. The majority of benign pigmented skin lesions remained simple and quiescent. If left alone, most of them never came to anything serious; they remained inactive and did not become malignant. In the case of the dormant or quiescent lesions, "laissez tranquille" was the watchword and "let sleeping melanin lie" the golden rule. If there was no sign of active growth in pigmented lesions they should be left alone whenever possible.

Dr. de Monchaux said that for cosmetic reasons, sometimes, it might be desirable to remove a simple pigmented lesion of the skin; the primary indication was then (as always, in any pigmented lesion, simple or malignant) irradiation. A fair number of benign pigmented lesions would respond to radiotherapy (X-ray therapy was, he thought, the treatment of choice); others might need the help of surgery, but always a course of irradiation should precede any surgical ablation. If, on microscopic examination, the excised pigmented lesion proved to be benign, then no post-operative radiotherapy was necessary. If, however, what was thought to be a simple lesion should prove to be malignant, then, as well as pre-operative irradiation, a full and thorough course of post-operative X-ray therapy was indicated. Apart from cosmetic reasons, it was advisable to remove a pigmented skin lesion if it was subject, by reason of its position, to any sort of chronic irritation.

The clinical sign of activity in any pigmented skin lesion was, of course, increase in the size of the lesion. The transverse diameter of the growth might increase or it might become more thickened and/or heaped up (that is to say, its depth might increase). Any increase in any dimension of the lesion meant definite activity. That applied to all pigmented growths, but was of special significance in the case of the malignant melanomata. At the first sign of clinical activity, the procedure in every case was, first and foremost, wide irradiation to control the activity of the growth and to sterilize the surrounding field. In other words, the primary indication was for a wide irradiation of the lesion and its immediate environs. If the growth did not respond to radiotherapy (in the form of X-ray therapy), then, after the usual interval, a wide excision should be performed, followed as soon as the wound had healed by a full course of post-operative X-ray therapy (again to a wide field). That procedure gave the patient the best chance of survival, by reducing the risk both of local recurrence and of distant dissemination. As a class, unfortunately, the pigmented skin lesions belonged to the moderately to completely radio-resistant groups of tumours. That radio-resistance was due to their characteristic ingredient, melanin, whose whole purpose and function was to absorb radiations. Melanin was an effective screen or absorbent of radiant energy (the Negro was superior to the white man in that regard, having much more melanin in his skin; it was, indeed, the melanin which made him a Negro). It needed to be remembered, however, that pigmented skin lesions varied in radio-sensitivity, some of them being much less resistant than others. That variability in their sensitivity depended on the variable amount or proportion of pigment (melanin) they contained or, more simply, it depended on the relative proportion of melanin to cells present in the growth. The more melanin in the lesion, the more radio-resistant it was; the less melanin, that is, the more cellular, the less radio-resistant.

Dr. de Monchaux said that, as he had already stated, quite a percentage of the benign pigmented lesions responded to irradiation alone; others needed the help of surgery as well. Most of the malignant melanomata, on the other hand (the great majority, in fact) needed the combined method of treatment for the best therapeutic result, that is to say, wide pre-operative irradiation, wide excision, and wide post-operative radiotherapy. It was a great, and often fatal, mistake to set about excising a melanoma without previous irradiation. They were all familiar with the disastrous results, in cases of that most grave and malignant lesion, the melanoma, of injudicious and inadequate surgical inter-

ference, as a primary measure (properly called "interference" in such cases). Often in those cases the surgical excision was imperfect and incomplete; it was in fact an incision rather than an excision. They had all seen too—and especially one saw those things in a busy radiotherapy department—the rapid local recurrences, and unfortunately also the extensive metastatic dissemination, occurring after partial excision (or incision) of a malignant melanoma. It had been shown conclusively, both experimentally and clinically, that there was no better way to stimulate the activity and promote the spread of a melanoma than by incising or partly excising it. In all cases, therefore, in which a pigmented skin lesion, benign or malignant, showed signs of activity, radiotherapy (and not surgery, as many people still thought) was the primary indication. Two golden rules remained in the treatment of all pigmented skin lesions: when possible, to let sleeping melanin lie; and never to attempt to excise such lesions without previous irradiation.

Dr. FRANK STEPHENS discussed low voltage or contact therapy and the results of extensive experience of its use in the treatment of superficial skin lesions. He described the contact therapy machine with shockproof tube designed by Chaoul and discussed the depth doses obtained, particularly in comparison with those from a radium bomb. He pointed out that contact therapy provided a radiation beam that was readily absorbed by the surface tissues without damage to the normal tissues forming the tumour bed, thus ensuring maximum damage to the growth with minimum interference with repair; it was therefore usually the method of choice for the treatment of superficial skin lesions.

Dr. Stephens went on to describe the advantages of the method. The shockproof tube was very mobile and treatment could usually be given to the patient comfortably seated; the applicator was applied directly to the skin and fixed in position, the field being thus sharply defined; there was no danger to the operator if the direct beam was avoided, scattered irradiation being negligible. The time of each treatment was from one to four minutes; there was a minimum of inconvenience to the patient and no discomfort; the absence of constitutional upset made it possible to treat numerous areas at one visit. The cost was only a fraction compared to the cost of radium usage. Admission to hospital was not necessary, patients usually remaining at work. Handling and trauma were minimal, the risk of sepsis being thereby reduced. The cosmetic effects were better, it being often difficult to notice any scar, even after removal of a large tumour. Contact therapy was not indicated for infiltrating lesions or for those which could not be brought into contact with the applicator, or when some part of the tumour was out of effective range of the limits of the beam.

Discussing the clinical effects, Dr. Stephens said that the average daily dose in the treatment of skin tumours was from 400r to 1000r; that dose might be given to each of many fields. The skin reaction was similar to, but appeared earlier than, that following radium. Regression of the size of the tumour was often appreciable by the third day. With intensive treatment skin sloughing might occur, but rapid ingrowth of epithelium from the periphery took place, resulting in a pale scar. Although contact therapy was the method of choice for lesions that came within its effective range, it was necessary for the radiotherapist to have more than one plant, so that he was provided with a range of irradiation of varying penetration from which the best choice of treatment might be made for each patient. The object of treatment was to apply the smallest effective dose to a tumour with the minimum damage to the surrounding tissue, but in practice one tended to give rather an overdose in the first course of treatment, rather than risk subsequent recurrence of a less radiosensitive lesion, especially if the nature of the lesion had not been previously determined by biopsy. Early superficial cancer was usually curable, often by alternative radiotherapeutic methods, the method of choice being the one that brought about the desired results with the minimum of discomfort, inconvenience and expense. Dr. Stephens then described the general method of assessing and distributing the dose and discussed briefly the place of contact therapy in the treatment of warts and plantar papillomata, precancerous conditions such as keratoses, angiomas, basal and squamous cell carcinomata, tumours around the eye and carcinomata of the eye, and other tumours for which it had been used.

Dr. A. G. S. COOPER said that it was an acknowledged fact that the incidence of cutaneous malignant disease was far higher in Australia than anywhere else on the globe, and it was probable that Queensland had a higher incidence than had other States of the Commonwealth. Statistical analysis

carried out at the main centre of the Queensland Radium Institute indicated that 65% of new patients treated for malignancy were suffering from skin cancer. Many of the patients in that group developed fresh lesions each year, and, during the twelve-month period ending July 30, 1947, 4700 new and old patients, having some form of malignant lesion, were seen. Of those approximately 80% attended for treatment of skin cancer.

Discussing general principles in treatment, Dr. Cooper said that it was felt that  $\gamma$  and X radiation produced similar qualitative biological results. In the customary application of those agents there were differences in the time-intensity factor and those differences were chiefly responsible for some variations in the nominal total dosage. He summarized the literature dealing with dosage rate and the work of Strandqvist on the time factor.

Strandqvist advocated the completion of all treatment for cutaneous malignancy within a total period of three weeks, before the onset of any intense skin reaction.

Dr. Cooper said that clinical observations indicated that, in general, rather less scarring of the skin followed an adequate dose of  $\gamma$  radiation than after a comparable fractionated dose of X rays, particularly when the lesion treated was situated on a relatively avascular or atrophic surface. He discussed the possible biophysical reasons for that finding. Cutaneous scarring was minimized by uniformity of dosage at the skin level, whilst any gross lack of uniformity predisposed to residual malignancy, post-radiation ulcer, or both those conditions concurrently. Any application of X rays or radium by mould would be regarded as non-uniform if the ratio of maximum skin dose to minimum tumour dose was greater than 3:2.

The choice of treatment method should be made without bias by the therapist, who should have access to a suitable range of X-ray apparatus, supported by adequate supplies of radium and radon. In general, the method which yielded the requisite minimum tumour dose with the least tissue trauma was preferred.

Discussing methods of treatment, Dr. Cooper described in detail a technique of X-ray therapy devised to cope with staff difficulties during wartime. The objects were that it should be easy to teach, should minimize the possibility of error, should be applicable to the majority of lesions seen and should provide an effective cure. The plan depended on a reasonably accurate clinical assessment of the depth of the base of the lesion and a determination of its pathology. In the event of any doubt regarding thickness an overestimate was recommended, whilst any uncertainty in pathology indicated the need for preliminary biopsy.

Speaking of radium and radon techniques, Dr. Cooper said that it would be preferable to abolish the use of radium plates for the treatment of any form of malignancy. Plates should never be used for the treatment of squamous cell carcinomata and, when used for rodent ulcers, were only warranted for lesions under two millimetres in thickness, and there should be ample coverage at the margins. A mould was regarded as the treatment of choice when (i) the lesion was raised above, rather than depressed below, the surface, the overall depth of base of the lesion being not greater than 0.5 centimetre; (ii) the site of the lesion was relatively flat or convex outward and lent itself to immobilization; (iii) the base of the lesion was in proximity to bone, cartilage or fascia. The dosage favoured in practice was a minimum tumour dose of 4500r, over a seven-day period; 4800r was preferred. On clinical estimation of reactions and results obtained from radium moulds, as compared with radon moulds, no significant difference had been noted. Radon seeds had many technical advantages and moulds for small areas or for curved surfaces could not be loaded with radium needles when accuracy of dosage was paramount. Implant was often the treatment of choice in the deeply infiltrating but little elevated lesion. Occasionally a thick lesion would demand a "sandwich" treatment by mould and implant forming two opposing planes. The average tumour dose usually favoured for cutaneous malignancy had been 6000r over seven days in radium implants and the same total dosage for permanent radon seed implants.

Dr. Cooper said that among 1349 patients treated at Brisbane Hospital for basal cell cancer of the skin between 1929 and 1941, there was a five-year survival rate of 97%—after elimination of those deceased from intercurrent disease. A similar analysis showed a 90% five-year survival rate for squamous cell epitheliomata, whilst the three-year survival rate was 95%. Of a group of 250 patients with epithelioma and/or rodent ulcer, treated over the period January, 1944, to December, 1946, by radon moulds with central excavation, 177 had been healed, nine incompletely healed, four healed



by surgery, four healed after recurrence, and for 53 the result was not known; metastases were present in two cases and developed in six; one patient died from the neoplasm and eleven from intercurrent disease.

Dr. J. C. MAYO listed and classified the principal superficial conditions that were treated by the radiotherapist exclusive of those that primarily concerned the dermatologist. He described the details of therapy that he had used for particular types of lesions, with illustrations drawn from his own clinical experience.

Discussing the importance of the dosage and time factors and the fact that they were interlinked, he pointed out that it was essential to give an adequate lethal dose to a tumour and to the whole of the tumour. With radium he usually aimed at a minimum dose of 7000r; this could usually be given safely in a week or less, although with a large area he preferred to extend the time to a fortnight. With X rays, he occasionally treated small lesions in a single dose, giving approximately 3000r; otherwise he used a divided dose technique, usually giving three doses at forty-eight-hour intervals. His usual dose with X rays for a small malignant surface lesion was about 4500r using a current of 110 kilovolts with a half-value layer of 2.4 millimetres of aluminium. For deeper lesions he used 140 or 185 kilovolts, giving 5500r or even more and usually extending the time to a fortnight.

Dr. Mayo concluded by saying that in his opinion X rays had displaced radium for treatment of most of the superficial skin lesions for three reasons: (i) speed of treatment; (ii) avoidance of necessity for admission to hospital; (iii) safety of the operator. For certain lesions within the body radium retained its place. He considered that, with the exception of certain conditions such as malignant melanoma, the outlook for the treatment of surface malignant lesions by radiotherapeutic means was very bright, and adequate treatment should bring a five-year salvage of well over 90%.

PROFESSOR H. C. WEBSTER discussed technical details of the treatment of superficial skin lesions, more particularly from the physicist's point of view.

Dr. VAL McDOWELL said that he was sceptical of the importance of exposure to the sun in the aetiology of basal cell lesions. Many of the sites of occurrence were less exposed to the sun than other parts of the face and body. He suggested that the factor of heat might be more important, causing the skin to overwork. He also referred to the importance of dust, products of decomposition and sweat which collected in the folds of the skin and caused friction. He expressed the opinion that a melanoma should be removed surgically, not necessarily after irradiation. Local anaesthesia should never be used.

Dr. KAYE SCOTT referred to the work of the Dawson School in Edinburgh on the origin of melanomata, which he felt had explained the majority of lesions more satisfactorily than the French school, by which he felt Dr. de Monchaux had been influenced. He outlined the treatment which he employed for melanomata. He considered that if the lymph glands were involved, the prognosis was very grave. The glands might be capable of removal from the neck, but the chance of cure was not great. They could not be removed from the groins. Dr. Scott referred to the value of interstitial radiation and expressed the opinion that melanomata were not as radio-resistant as was usually claimed. He agreed with Dr. Cooper that the use of radium plates should be condemned. With regard to biopsy, he considered that that was important, but that it should not do any damage to the patient; a small piece of tissue was all that was required.

Dr. McDowell commented on Dr. Kaye Scott's condemnation of the use of radium plates. In Dr. McDowell's opinion, radium plates had a real value, especially in the treatment of early basal cell lesions in private practice.

Dr. C. E. EDDY said that Professor Webster's paper in particular had been much appreciated by the physicists present and he felt that the type of work could be extended to fields other than the skin.

Dr. W. LEMPRIERE, speaking as a dermatologist, said that he considered that the radium plate was very useful in the treatment of basal cell carcinoma and keratosis. He referred to the effect of the sun as seen amongst men from the services. In the Middle East, with its dry heat, keratosis and desert sores had been common; those men were now developing keratosis and rodent ulcer. In the South-West Pacific, where there was not so much direct sunlight, there had not been the same tendency to develop keratosis and tropical ulcers were common; men of that group were now developing waxy tumours, basal cell carcinomata of sebaceous origin.

Dr. E. W. CASEY said that the decision as to the choice of a therapeutic agent should be made only after the examination of the individual lesion. In his opinion, radium plates had a big field of usefulness. Dr. Ralston Paterson had been horrified at their use when he visited Australia, but Dr. Casey considered that a special type of lesion occurred in Australia. No objection could be raised to the careful use of the plates; any given dose could be reproduced accurately. Many lesions only needed simple treatment, and for that a radium plate was very useful.

Dr. W. P. HOLMAN said that it was the surgeons' practice in Tasmania to carry out a wide excision of malignant melanomata.

Dr. A. M. JOHNSON commented, with regard to the treatment of plantar warts, that plastic surgeons still showed patients at clinical meetings with necrosis due to X-ray treatment of that condition. He considered that the type of treatment required for epithelioma of the back of the hand depended on the occupation of the patient; for example, a labourer might easily suffer trauma to an irradiation scar with resultant necrosis. In such cases it might be better to excise the scar and to insert a skin graft.

Others who contributed to the discussion were Dr. F. DUVAL, Dr. J. STAPLETON, Dr. A. J. CAMPBELL and Dr. J. B. McMIKEN.

Dr. de Monchaux, in reply, said that the question of the histogenesis of basal cell carcinoma was still open. He explained that the variability in sensitivity of melanomata depended not only on pigment, but also on the type of cell which varied. He agreed that the treatment of malignant melanoma was a surgical problem, but felt that all surgeons did not excise sufficiently widely. The use of pre-operative irradiation might effect a cure in itself or would ensure that no recurrence took place after surgery.

Dr. Stephens, in reply, said that he had not seen the phenomenon mentioned by one speaker, in which a whole crop of warts subsided after the treatment of one. He had found that contact therapy was best for plantar warts. The treatment of melanoma was a surgical problem and the surgeon must be consulted. Very few of the tumours behaved alike. In reply to another speaker, he said that an effective irradiation dose applied to angiomata over bone did not damage the bone.

Dr. Cooper, in reply, said that he treated carcinoma of the back of the hand by means of a radon mould and discussed the procedure and dosage used. He said that most of the scars on the backs of hands were good and he did not think that the majority of patients would desire surgical treatment.

Dr. Mayo, in reply, thanked the speakers for their remarks.

Professor Webster, in reply, said that radon moulds for the treatment of angiomata of infants were satisfactory; there was no difficulty in ensuring the retention of the moulds. Older children were sometimes refractory, and for them X-ray treatment might be necessary. He discussed details of the preparation and use of moulds.

#### The Annual Lecture.

The annual lecture of the Association was delivered by Dr. H. R. SEAR on "Osteitis Deformans: A Review and Reflections after Thirty-Five Years' Experience".

#### Resolutions of Conference.

The following resolutions were adopted by the conference.

1. That the present system of pathological classification of malignancies should be reviewed and any modifications required be recommended by a committee consisting of Professor P. MacCallum (chairman), Professor W. Keith Inglis, Dr. Edgar S. J. King, Dr. A. H. Tebbutt, Dr. B. R. V. Forbes (secretary).

2. That opportunities be given for physicists to travel abroad to study and gain experience which could be made available to staffs of physicists serving at Melbourne and elsewhere in the Commonwealth.

3. (a) That control of nitrogen mustard therapy be vested in the Committee on Radioactive Isotopes of the National Health and Medical Research Council. (b) That the Commonwealth Department of Health approach Dr. C. P. Rhoads at the Memorial Hospital, New York, so that supplies of nitrogen mustard to approved centres may be ensured. (c) That the Commonwealth Department of Health arrange that the importation of these substances be made legal.

4. That steps be taken by the Minister for Health to have Australia represented at the Conference of the International Cancer Research Commission, and to arrange finance for attendance at Paris in October, 1948.



## British Medical Association News.

## SCIENTIFIC.

A MEETING of the Victorian Branch of the British Medical Association was held on July 17, 1948, at the West Gippsland Hospital, Warragul. MAJOR-GENERAL F. KINGSLEY NORRIS, C.B.E., D.S.O., the President, in the chair. The afternoon session took the form of a series of clinical demonstrations by members of the Gippsland Subdivision. At the evening session Dr. W. F. FERGUSON (Trafalgar) introduced a discussion on "Clinical Aspects of Leuchæmia". Part of the report of this meeting was published in the issue of August 28, 1948.

## Polycystic Kidneys.

DR. W. F. FERGUSON (Trafalgar) showed a woman, aged sixty-five years, who had come under notice because of the presence of a palpable tumour in the left loin. Dr. Ferguson said that he had been unable to outline either kidney by excretion pyelography, that under test conditions no dye was secreted from either side, and that the blood urea level was well above the normal limit.

DR. HAROLD MOORE (Melbourne) said that he had examined the patient and was satisfied that he could also feel a mass in the right loin. On the assumption that the mass was in the left loin only, it would be natural to think of the presence of a tumour such as a hypernephroma. Negative results had been obtained from excretion pyelography and the blood urea level was high; those facts enabled him to exclude a unilateral lesion and to diagnose bilateral polycystic kidneys. From the skiagrams supplied by Dr. Ferguson, illustrating the results of retrograde pyelography, Dr. Moore demonstrated the irregularity of the calyces and commented that the abnormal appearances were due to cystic distortion of the kidneys. He added that the appearances naturally varied considerably with the infinite variety of possibilities arising from the situation and presence of cysts of varying sizes.

DR. LESLIE HURLEY (Melbourne) observed that it was surprising to notice the length of time for which patients with polycystic disease might live with consistently high blood urea findings.

DR. IAN MCLEAN (Melbourne) wondered whether the disease always started bilaterally.

DR. B. L. DEANS (Warragul) said that he could remember a unilateral case; he had looked the point up in the medical literature and had found references indicating that for years the disease could appear to be unilateral in certain cases.

DR. G. A. PENNINGTON (Melbourne) suggested the possibility that the diagnosis might be pyelonephritis superimposed on trauma.

DR. JOHN MULLANY (Melbourne) commented on the size that polycystic kidneys could reach, and said that he could remember that, at an autopsy at the Alfred Hospital, the kidneys weighed nine pounds and seven pounds respectively.

DR. W. McI. ROSE (Department of Pathology, University of Melbourne) reported that he had come across a pair of polycystic kidneys, one weighing twelve pounds and the other four and a half pounds.

DR. CHARLES OSBORN (Melbourne), with reference to treatment, said that, when the condition was diagnosed at an early age, it was worth while to puncture the larger cysts which were accessible, in order to avoid the effects of pressure atrophy on normal renal tissue.

DR. LESLIE HURLEY commented that some of the cystic areas contained functioning kidney as a rule, and doubted whether it had been proved that puncturing improved matters.

DR. MOORE, in reply to a question from Dr. N. Pescott (Sale), said that cysts that were punctured had not filled again, and that puncturing relieved pain. He added that he had had the opportunity to examine the kidneys at a second operation, after previous puncture, and had found undoubtedly that the cysts were fewer. The puncturing operation did not appear to lower the blood urea level, and it was arguable that other cysts might be freer to expand. In reply to a question from Dr. Conrad Ley, Dr. Moore said that ectopic kidneys could become polycystic.

## Clinical Aspects of the Leuchæmias.

DR. W. F. FERGUSON (Trafalgar) opened a discussion on leuchæmia. He said that recently at Yallourn they had come across two rather obscure cases of interest from the hematological point of view, in which provisional diagnoses of several different conditions had been made before the

final diagnosis of leuchæmia was determined. The interest evoked by the step leading up to this diagnosis had led to the preparation of his remarks.

DR. FERGUSON went on to say that leuchæmia was usually thought of as being an obvious and easily identifiable disease. In many cases this was so. When a patient presented with an enormously enlarged spleen, obvious anæmia and a leucocytosis of 400,000 per cubic millimetre, the diagnosis could hardly be called obscure. However, even in that type of case errors in diagnosis could be made if an adequate general examination was not carried out. The patient might complain of chronic indigestion rather than of splenomegaly, and that, combined with the anæmia, might lead to a diagnosis of gastric carcinoma. Similarly the anæmia and toxæmia might lead to a condition resembling thyrotoxicosis. Dr. Ferguson said that he himself had considered a patient dying of an acute exacerbation of chronic myeloid leuchæmia as suffering from basal pneumonia, until a laboratory report had forced him to make a more thorough examination. The acute leuchæmias might give more trouble, although once attention was directed to the hematopoietic system the diagnosis was usually made readily. However, the frequency with which the onset occurred with necrotic mouth lesions often led to such diagnoses as diphtheria, Vincent's angina or tonsillitis. The prominence of various symptoms might for a time cause confusion with other conditions, and a long list of more or less academic differential diagnoses might be prepared. However, the main object of his remarks was to discuss the difficulties arising in what was known as aleuchæmic leuchæmia.

DR. FERGUSON then said that Osler had defined leuchæmia as "a disease characterized by a permanent increase in the leucocytes of the blood, associated with hyperplasia of the leucoblastic tissues". There was a general tendency to emphasize the first part of that definition—the leucocytosis—and to forget the second part, even though the hyperplasia of the leucoblastic tissues was responsible for almost all the signs and symptoms, while the leucocytosis was variable in intensity, and its presence or absence at any moment made very little difference to the patient's clinical condition. At autopsy the tissues generally were found to be infiltrated with the cells characteristic of the particular type of leuchæmia, and the symptoms and signs could be related to that infiltration. Whether at any time the number of circulating leucocytes was increased was immaterial. From the point of view of production of symptoms, the most important tissue was the bone marrow. Infiltration of bone marrow resulted in interference with production of all the blood elements; but usually deficiency of one blood element—leucocytes, erythrocytes or platelets—might occur to a sufficient extent to produce symptoms before the others were involved, so that a corresponding variety of types of onset might occur. First, interference with erythropoiesis might be considered. This could give rise to a considerable variety of obscure anæmias, and the clinical history of a case was worth quoting in that connexion. The patient, a man, had complained of vague weakness and malaise of about three months' duration. General examination showed him to be well nourished and rather flabby, with a pronounced icteric tinge. The spleen was just palpable. No other abnormality was found. A blood examination gave the following information: the hæmoglobin value was 50%, the erythrocytes numbered 1,730,000 per cubic millimetre, and the appearances in a film suggested pernicious anæmia. That was considered sufficient to establish the diagnosis of pernicious anæmia, and a course of liver injections was begun. No rise in the hæmoglobin value or the number of erythrocytes followed, so he was given a number of blood transfusions, which also produced no improvement. Finally a sternal marrow puncture was performed, and the following report was made by Dr. Hilda Gardner:

The bone marrow is mixed with a considerable amount of blood and the nucleated red cells and leucocytes are fairly sparsely spread through the smears. The majority of the nucleated red cells are normoblasts with a small proportion of late erythroblasts and a few early erythroblasts. The outstanding feature of the film is the number of primitive leucocytes which are present. The cells are of large size with basophilic cytoplasm and in some there are azurophil granules. The nucleus is palely stained and contains 1-3 nucleoli. Some lymphocytes and old and young metamyelocytes are also present. A considerable number of partially disintegrated cells (smear cells) is present. These are common in leuchæmic conditions. I think these smears undoubtedly indicate a leuchæmia, but as there were no spare slides for peroxidase staining it is difficult to be certain of the type cell. I think the large size of many of the cells

and their general morphology suggests a monocytic leukaemia, but this diagnosis in the absence of supravital staining and peroxidase reaction is made with reserve.

Dr. Ferguson said that there were several lessons to be learned from the case. First of all, it illustrated a fact which was not widely known—namely, that pernicious anaemia was a difficult disease to diagnose. On clinical examination the patient presented typical signs of pernicious anaemia. From his general appearance of a well-nourished, icteric flabbiness, he could almost have been the man described in Addison's original paper. His palpable spleen and blood findings made him even more like a typical pernicious anaemia patient. Despite such cases, one still heard of the clinical diagnosis of pernicious anaemia being made, often even without a haemoglobin examination, and of the patient's being started on courses of liver injections. Dr. Ferguson said that he had encountered one case in the last three years which he considered to be one of pernicious anaemia; but other medical men with practices about the same size as his counted by the dozen their patients receiving courses of liver injections. Pernicious anaemia was rather unfortunate in having such a spectacular name, and for that reason it was regarded by some people as a synonym for "severe anaemia". Only recently a patient had said to him: "The doctor said I had a dreadful anaemia, verging on pernicious." There is also very little general knowledge of the functions of liver in pernicious anaemia. For example, in 1947 in THE MEDICAL JOURNAL OF AUSTRALIA there had appeared a letter from a doctor describing a case which he diagnosed clinically as of pernicious anaemia, beginning a course of liver injections pending an opportunity for haematological investigation. The only effect of that procedure would be to delay and confuse proper haematological diagnosis.

Reverting to his own case, Dr. Ferguson said that in retrospect the first error committed was the neglect to make serial reticulocyte counts. Had this been done, the absence of a reticulocyte crisis would have given early warning that the case was not one of Addison's pernicious anaemia, and that it would have to be classed at least among the refractory anaemias. As soon as the diagnosis of refractory anaemia was made, the next step would have been to make a sternal marrow puncture. Had these steps been taken, the diagnosis would have been made within a fortnight of the patient's admission to hospital, a considerable amount of liver and donor's blood would have been saved, and possibly effective treatment would have been commenced if the leukaemia was of the chronic type. Referring again to pernicious anaemia, Dr. Ferguson said that reticulocyte counts would prevent other errors, as was shown by the following case. An Italian, aged fifty-five years, had attended an out-patient department of a country hospital. He also appeared a typical icteric, flabby, pernicious anaemia subject. The blood counts and smear were regarded as typical of pernicious anaemia, so he was started on a course of liver injections. Serial reticulocyte counts were made, which showed no rise in the number of reticulocytes. However, since the patient's haemoglobin level was rising, Dr. Ferguson's colleagues and himself had pooled their accumulated ten years of haematological experience and decided that that showed that the text-books were always wrong, as Professor F. Wood Jones used to say. The patient was eventually discharged from hospital, but did not return for his liver injections until twelve months later, when he returned in the same condition as before. The same performance was repeated, and he disappeared into the bush for another twelve months. After that time he returned, not particularly anemic, but with an ischio-rectal abscess. During treatment this was found to be due to an inoperable carcinoma of the rectum. Presumably that had been the cause of his pernicious anaemia syndrome, and if proper notice had been taken of the reticulocyte counts, his life might have been saved by an earlier operation.

Dr. Ferguson next referred to cases in which the main effect seemed to be on the foundation of blood platelets, and gave the following example. A heavily built, well-nourished Italian, aged twenty years, had attended the out-patient department of the same hospital, complaining of malaise, cough and pyrexia. A few scattered crepitations were found at the lung bases, so he was given some sulphapyridine and sent home to bed. His condition improved a little and he went back to work, but he returned in a fortnight with the same story. He was given more sulphapyridine, and again his condition improved. Two weeks later he attended the casualty department during the night, with an epistaxis. The resident medical officer on duty packed his nose and sent him home. That happened several times during the next week, until one night the haemorrhage

was so persistent that he was admitted to hospital. He had apparently lost so much blood that his haemoglobin value was estimated; it was 40%, so he was given a blood transfusion. When the epistaxis continued, eventually a full blood count was asked for. This revealed, as well as pronounced normochromic anaemia, almost complete agranulocytosis. The condition was then regarded as agranulocytosis due to the two courses of sulphapyridine. The patient was given the standard doses of "Pentnucleotide" and massive blood transfusions. When he showed no improvement, he was transferred to a teaching hospital. Dr. Ferguson had only hearsay knowledge of what happened there; but he believed that the diagnosis of agranulocytosis was confirmed, and that the patient was given more "Pentnucleotide" and more blood transfusions. Eventually he died, and at autopsy the diagnosis of aleucaemic leukaemia was made. Dr. Ferguson said that two lessons could be learned from that history. First, the diagnosis of agranulocytosis should have been put out of count by one point—namely, the epistaxis. Agranulocytosis was the response to some substance which inhibited granulopoiesis. Toxic substances which inhibited both granulopoiesis and thrombocytopoiesis might occur, but they would be rare. In practice, the only process which could inhibit both white cell and platelet formation simultaneously was leukaemia. Secondly, the correct diagnosis could have been made at any point by sternal marrow puncture. That type of case was fairly common. Dr. Ferguson had been told of three cases, not all associated with haemorrhage, but cases in which an initial diagnosis of agranulocytosis was made, the condition later being proved to be aleucaemic leukaemia. Dr. Ferguson thought it safe to say that aleucaemic leukaemia was much more common than agranulocytosis, and that it was the more likely diagnosis unless there was a clear history of exposure to one of the dangerous drugs in that particular, such as thioracil or amidopyrine. The case also illustrated the involvement of the third bone marrow component, the leucocytes, although in that case the typical symptoms of agranulocytosis (the necrotic throat lesions) were not seen. This led to the main point of the discussion—the extreme value of bone marrow puncture in the diagnosis of obscure blood conditions. In some cases, as in those mentioned, that procedure might produce order out of chaos. It might be said that the diagnosis of aleucaemic leukaemia was often impossible without it, especially in cases in which examination of the circulating blood merely revealed anaemia, and there was no appreciable splenic or lymph gland enlargement. In acute leukaemia, especially in children, it could be of value in differentiating leukaemia from the various conditions which produced leukaemoid blood pictures. For example, a girl, aged five years, was examined two months after a severe attack of measles with bronchopneumonia. She was admitted to hospital with a provisional diagnosis of pneumonia, but during investigation extreme anaemia was found, with a low leucocyte count, all the leucocytes being primitive cells. It was thought that this might have been one of the peculiar blood pictures commonly seen in measles and pertussis, so that blood transfusions and penicillin treatment were persisted with. Eventually death occurred, and the presence of the suspected leukaemia was confirmed. That case was fairly straightforward; but a sternal puncture would have confirmed the diagnosis of leukaemia and saved a great deal of useless treatment. There were other uses for sternal puncture. The diagnosis of pernicious anaemia might be made with confidence in doubtful cases; large numbers of megaloblasts were seen, often in syncytial masses. In agranulocytosis, marrow punctures had a more limited value. It used to be taught that there were two varieties of agranulocytosis, aplastic and maturation, and that bone marrow counts would differentiate these and show which patients were likely to respond to "Pentnucleotide". However, it was now thought that the maturation types were merely those in which spontaneous recovery was occurring, and in which the patients not unnaturally showed a good response to treatment. Since death occurred from infection, if that could be kept under control with penicillin, the aplastic variety of agranulocytosis would eventually become the maturation variety, and recovery occurred in a large proportion of cases. Therefore in agranulocytosis the main value of sternal puncture was to eliminate the possibility of aleucaemic leukaemia. In aplastic anaemia, although sternal puncture would eliminate aleucaemic leukaemia, for a proper estimate of the degree of aplasia a full biopsy should be performed and a section examined, as for any other tissue. Finally, a few curiosities might be seen, such as Gaucher's cells, plasma cells (indicating myelomatosis) and occasionally malignant cells.

Dr. JOHN McLEAN (Melbourne) congratulated Dr. Ferguson on the way in which he had presented the subject. He



then commented on the apparent increase in the prevalence of leucæmia. In 1900 the mortality rate was approximately one per 100,000 population, but in 1945 the deaths were about 4.5 per 100,000. The increase might be due to improvements in diagnosis, but the rise was rather too pronounced to be explained in that way. The use of new chemicals in industry and of new drugs in therapy and the increase in exposure to exhaust gas fumes might be contributing factors. Personally Dr. McLean had seen more cases latterly and especially the aleuchæmic forms that were only diagnosable by means of marrow studies. Dr. McLean in discussing the treatment of the leuchæmic diseases commenced with the frank admission that it was not possible yet to treat with the expectation of curing the patient, though it was the aim of treatment to make the patient more comfortable and to influence remissions and prolong life. Radioactive phosphorus and deep irradiation therapy were still in the experimental stage, but transfusions of blood were helpful and temporarily overcame the anaemia. Recently Harbord had raised hopefulness in connexion with the management of patients with acute leucæmia; following upon his experiences with folic acid he had introduced aminopterin and had reported improvement in five cases in *The New England Journal of Medicine*. Dr. McLean then said that he had used aminopterin once very recently for a three-year-old girl; on June 26 intramuscular injections of the drug in two millilitres of saline solution were instituted as a daily procedure which was continued for several days at a time. The treatment was liable to cause diarrhoea and vomiting from toxicity. After three weeks he was able to state that the bone marrow was much improved, that the "blast" cells in the peripheral blood were reduced to only 1% and that cells of the granular series had reappeared. He had also given transfusions of blood, although the bone marrow was aplastic at the time.

Dr. JOHN COLEBATCH (Melbourne) said that he wished to speak about leuchæmic conditions in infancy and childhood; the process was acute in its course in subjects under the age of five years and over the age of forty-five years. He held the view that the stimulant for the neoplastic process was probably an infection of some kind; Dr. Donald Paterson, at Great Ormond Street, had stated that he was sure of that fact so long ago as 1938. Dr. Colebatch went on to say that it saved time and trouble to examine the sternal marrow at an early stage; in some cases the diagnosis was made from peripheral blood films. Atypical cases were very common, making the differential diagnosis difficult. Aplastic anaemia was not common and was usually associated with benzol and other toxic agents; in ten years at the Children's Hospital, Melbourne, there had been only one case of aplastic anaemia for every 25 cases of leucæmia. With a lack of red blood cells, reticulocytes, and other features in the peripheral blood films and a scarcity of blood-forming elements in bone marrow preparations, it was easy to diagnose aplastic anaemia and hard to recognize the leucæmia. Idiopathic agranulocytosis also could come prominently into the differential diagnosis, as in the case reported recently by Dr. H. Boyd Graham in *THE MEDICAL JOURNAL OF AUSTRALIA*; in that case the true diagnosis was not revealed by repeated sternal puncture. Leucæmia could also masquerade as hemolytic anaemia. Splenomegaly and purpura of unknown cause might turn out to be due to leucæmia. The rheumatic picture might also be the beginning of leucæmia. Dermatological conditions might present and leucæmia turn out to be the answer. With reference to treatment, Dr. Colebatch considered that there was no known cure and stated positively that, at present, radioactive phosphorus had no place at all. A lot of pain and discomfort was caused by the new methods of treatment; many blood films and marrow punctures were needed *inter alia*, but life could only be prolonged by a few short weeks. Judicious use of blood by transfusion and intensive chemotherapy to counter secondary infection were sound procedures, and remissions of activity could at times follow.

Dr. LESLIE HURLEY thanked Dr. Ferguson for the very practical paper showing the difficulties that could arise when facilities were available. Leucæmia was probably a neoplastic process, but any tissue stimulant could simulate it. It was not a disease of the blood, but of some part of the blood-forming organs. Dr. Hurley recounted the case of a young airman with crackling of air over the forehead. He had a bumpy head and, by radiography, a number of holes were visualized probably due to secondary malignant deposits. Dr. Hurley consulted with Professor Schüller in Melbourne (whose name is well known as a component in the title of Hand-Christian-Schüller's disease). During the next month or two many blood examinations were made, but no bone marrow studies were undertaken, as Dr. Hurley did not think that they were of much assistance. The

patient developed enlargement of spleen, liver and lymphatic glands and died of lymphatic leucæmia. Dr. Hurley added that, by sternal puncture, the presence of leucæmia was suspected, but, as in another case he quoted, the patient thought to have leucæmia might die of generalized tuberculous disease associated with multiple glandular hypertrophy. In a third case quoted by Dr. Hurley an acute inflammatory condition confused the issue. The patient presented splenomegaly and severe pain in the buttock, and the bone marrow was reported to be leuchæmic. The pain was due to a large abscess in the buttock, and, after evacuation of the contents, the patient was restored to health. In yet another case, splenic anaemia was the correct diagnosis and the patient was alive three or four years later. In conclusion, Dr. Hurley advised that any complicating infection should be cleared away before a diagnosis of leucæmia was made; that the evidence of the complete blood picture should be accepted in preference to concentration on any one part of it; that attention should be given to the type of cell predominating; and that bone marrow studies should only be made by skilled hæmatologists.

Dr. H. BOYD GRAHAM (Melbourne) expressed his interest in the subject of Dr. Ferguson's paper and the subsequent discussion. He said that the disease was a distressing one for all concerned and that it was his practice to withhold the diagnosis while any chance remained that some other diagnosis might be correct; that was a reversal of the usual policy to use a provisional diagnosis as a basis for treatment pending the definitive outcome of investigations and the clinical course of the illness. Dr. Ferguson had directed attention to the difficulties that arose from the "aleuchæmic" phases of the leuchæmias, which were probably more satisfactorily and rationally to be regarded as hypoplastic or aplastic stages of the blood-forming mechanism. Dr. Graham mentioned that he had encountered aplasia of the blood elements, singly or in combination at the beginning, at any stage in the course of leucæmia and as the terminal state.

Dr. J. ANDREW (Yallourn) also thanked Dr. Ferguson and expressed the opinion that it was right that a member of the subdivision should supply the evening paper at the meetings in provincial centres. He agreed that while there was a doubt about the diagnosis there was also a doubt about the unfavourable prognosis. Country practitioners had to face difficulties of interpretation in investigations; it was frequently necessary to send smears, films or skiagrams away for expert opinion. At Yallourn, during the past month, a baby, aged six months, had come under notice with an upper respiratory tract infection and had made good progress with penicillin and sulphonamide therapy until suddenly there was a rise in temperature and the baby became acutely ill. From the skiagrams it was confirmed that there was no pneumonic consolidation in spite of the meningismus. The red blood cell count was 50% below normal; the white cell count was 42,000 cells per cubic millimetre and almost all of the white cells were primitive. The child was thought to be the subject of acute myelogenous leucæmia, but in another day the temperature was lower and the white cells numbered only 22,000 per cubic millimetre with polymorphonuclear cells present in normal proportions, though somewhat primitive in appearance. A few days before the meeting the baby had developed neck stiffness and the cerebro-spinal fluid removed contained 205 cells per cubic millimetre and a low chloride content (595 milligrammes per 100 millilitres). From a stained smear of the deposit the presence of pneumococci and Gram-negative bacilli was adduced and the baby was sent to the Children's Hospital suffering from acute meningitis presumably of mixed ætiology. Had they accepted the inevitability of the diagnosis of acute leucæmia the child would have died, not from leucæmia, but from meningitis which, taken in time, was a curable condition nowadays.

Dr. G. A. PENINGTON (Melbourne) reminded those present that in a recent judgement published in the *British Medical Journal* it was considered to be established legally that leucæmia was a malignant process and the disease was disallowed as grounds for service pension or compensation. Dr. Penington said that he thought the decision was an appeal one from the previous judgement that, as doctors differed on the ætiology in evidence, the applicant for compensation had to get the benefit of the uncertainty.

Major-General Norris, from the chair, deplored exhibitionism on medical matters that disfigured the lay Press and the cinema and misled the public. In the United States of America the pundits were very concerned about what was going on and particularly frowned on the giving of premature publicity to research projects to the lay public.

Before calling upon Dr. Ferguson to complete the discussion, he thanked the members of the Gippsland Sub-



division for putting on such good fare at the afternoon session and again that evening. The observations and reflections and opinions based on clinical experience were the things that really advanced medicine.

In conclusion, Dr. Ferguson thanked those who had listened to him and those who had contributed to the discussion, and said that he was glad that his effort had met with approval.

## Post-Graduate Work.

### THE MELBOURNE PERMANENT POST-GRADUATE COMMITTEE.

The Melbourne Permanent Post-Graduate Committee will conduct a course at Warracknabeal, Victoria, on the weekend of October 9 and 10, 1948. The programme has been arranged as follows: Dr. B. Keon-Cohen, "Surgery of the Knee Joint"; Dr. T. Steel, "Recent Advances in Diseases of the Chest"; Dr. J. W. Johnstone, "Sterility"; Dr. J. H. Colebatch "The Pale Child". The fee for the course is two guineas. Enrolments may be made with the Secretary of the North-West Subdivision of the British Medical Association.

The Post-Graduate Committee will also conduct a course at Mooroopna on Saturday and Sunday, October 23 and 24, 1948, details of which will be published as soon as possible.

### THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

#### Seminar in Medical Statistics.

The Post-Graduate Committee in Medicine in the University of Sydney announces that Miss Helen Newton Turner will conduct the second of the series of seminars on "Measurements of Association between Two Variables" entitled "Relationships which are not necessarily Straight Line" at 5.45 p.m. on Wednesday, September 8, 1948. As the location of this seminar has not yet been decided upon, those interested in attending are asked to communicate with Miss Turner (telephone: MW 1600).

#### Annual General Course.

Dr. R. S. Corbett, F.R.C.S., a member of the senior surgical staff of Saint Bartholomew's Hospital, London, will deliver the following lectures in the Stawell Hall, 145, Macquarie Street, Sydney: Wednesday, September 22, at 4.15 p.m., "Ulcerative Colitis"; Wednesday, September 29, at 8.15 p.m., "The Management of Imperfect Descent of the Testis".

It is also announced that Professor L. S. P. Davidson, Professor of Medicine at the University of Edinburgh, will give a short course in hæmatology during February, 1949.

#### General Revision Course.

A general revision course will be held for two weeks beginning May 23, 1949.

## Obituary.

### PIERO FRANCIS FIASCHI.

We are indebted to Dr. F. A. Maguire for the following appreciation of the late Dr. Piero Francis Fiaschi.

In this world as we pass through we meet many people who in the main are a similar type all cut to a similar pattern and forming the mosaic of our lives; but Piero was different from the ordinary person. Since word came through bringing the melancholy news that Piero had passed away I have been struck by the similarity of expression used to describe him by many people whom I have met. They all described him as a "personality", and so he was. Piero was a man's man, humorous, generous to all, a loyal and devoted friend and an intense worker for the honour of his calling. He hated sham and injustice and fought to the bitter end against any injustice shown to his friends or himself.

In his practice he gave his every endeavour to the relief of his patients. His ability and knowledge earned him a high place in the medical world. It was good that he had lived and served his fellow man, and the memory of his goodness and kindness is, to his many friends and patients, a source of great comfort in the sorrow of his passing.

One fine attribute that Piero had which appealed to me tremendously was the filial devotion he gave to his father during his lifetime. His father was one of our greatest surgeons and the senior surgeon at Sydney Hospital for thirty-four years. Piero was intensely fond and proud of his father, and frequently he quoted his words during conversation with friends. There is something splendid about a man who speaks so well of his father. To his family he was bound by ties of deepest affection, and to them all and to his friends we offer our deepest sympathy.



Piero was born in Windsor, New South Wales, in 1879, and obtained his medical degree at Columbia University, New York. On completion of his studies he went to England and took his Membership of the Royal College of Surgeons and his Licentiate of the Royal College of Physicians. On his return to Australia he commenced practice, and with the exception of the period of the Great War had continued in practice until his death. As I have said before, he gave intensive service in his practice, as his many patients will bear witness, and the deep respect, affection and confidence shown by them is a fine tribute to his personality and qualifications.

In addition to the service he gave to the community in a medical capacity, he was intensely loyal to his king and country. Following the outbreak of the 1914-1918 war he served with the first contingent of Light Horse that left Australia. As commanding officer of the Thirteenth Field Ambulance, he saw service in Egypt and Gallipoli, and subsequently on the Western Front and in England he did specialist surgical work. During the war he was promoted

lieutenant-colonel, and at the conclusion of hostilities he returned to Australia and immediately recommenced practice. He still retained his interest in serving his country and eventually was appointed commanding officer of the Ninth Field Ambulance. At the completion of this appointment he took command of the Fourth Cavalry Field Ambulance which he relinquished to accept the position of Acting Director of Medical Services of the First Cavalry Division. He retained this position until age necessitated his transfer to the Reserve of Officers.

To all old soldiers he gave his support and medical knowledge, and they will never forget him in his consideration for their well-being. He also, on the death of his father, accepted the position of honorary medical officer to the South African Veterans' Association and carried out this office up to the time of his death.

His death, which occurred subsequently to burns he received when a spirit stove exploded, is a tremendous loss and it is tragic that his end should come in this way.

We offer to his family our deepest sympathy, but in their sorrow they may take comfort in the full life of service to his fellow men that Piero has given and the splendid character he demonstrated during his life.

I am reminded of the words spoken by King Arthur as he was placed in the barge which was to take him to his last resting place in Avallon and quote from Tennyson's "Morte d'Arthur":

The old order changeth, yielding place to new,  
And God fulfils Himself in many ways,  
Lest one good custom should corrupt the world.  
Comfort thyself: What comfort is in me?  
I have lived my life, and that which I have done  
May He within Himself make pure: but thou,  
If thou should'st never see my face again,  
Pray for my soul. More things are wrought by prayer  
Than this world dreams of. Wherefore, let thy voice  
Rise like a fountain for me night and day.

Piero has gone, but his memory will remain with us until the end of our days. May God comfort his spirit and give him the rest he has so richly earned.

Dr. E. Haslett Frazer writes: "And may there be no moaning of the bar, when I put out to sea" was one of Piero's last commands, only phrased rather more forcibly than Tennyson would have dreamed. To write about Piero at all is difficult; one is tempted to epitomize and say with Hamlet: "Here was a man, take him for all in all, I shall not look upon his like again". But because he was a traditionalist, and liked formalities, and for the sake of those who may not have had the privilege of his friendship, one feels enjoined to essay some memory, inadequate as it may be.

Piero Flaschi came of an old Florentine family whose history runs back to the early 1690's. Born in Windsor, New South Wales, of a distinguished Italian father and Irish mother, to his many lovable qualities were added the hospitableness and stubbornness of the northern Italian and the generosity and impetuosity of the Irishman, and, no doubt, at his birth his Etruscan goddess, Cupra, and his Celtic Sheela-no-gig, in whimsical mood, contrived to endow him with a few more distinctive qualities—just to make the man unforgettable.

Of his well-known military and medical activities others are more fitted to speak than I. But I do know that the two epochs of his life were his student days in New York and his army experiences in World War I. And I once heard a certain major-general say that, in the Gallipoli campaign, Piero Flaschi did more by his efforts than any other man to maintain the Australian troops on the Peninsula. In the medical specialty of venereal disease, which he had made so peculiarly his own, he achieved no little fame and his success was remarkable. His knowledge of this subject was vast and profound, and he was, I think, one of the world's great authorities. His methods may have sometimes appeared somewhat drastic, but he knew what he was doing and he got his results.

Of the man himself it is not easy to convey an adequate impression. Fulsome eulogy he would scorn, but he did value understanding. And to my mind this required some knowledge of modern psychology.

With all the intensity of his being he was proud of his family origins, proud of his work, proud of his military service and proud of his country. Outwardly abrupt in manner, vehement in verbal and, occasionally, in physical expression, intolerant, as Dr. Maguire said in his eloquent address at St. James' Church, of sham and hypocrisy, his was a virile and vital nature. He was, in the words of Goldoni, a "burbero benefico". Not for nothing did our

mutual friend, the late H. M. Moran, in his earliest book, make a play on the name Flaschi—terming him Peter Burraschi—the Stormy One! But actually he was a shy man and most sensitive, generous in the extreme, courteous, impulsive in giving of his best and the kindest-hearted of all. Naturally forceful, a man of the world—if a bygone one—a *bon viveur* loving the robustness and fullness of life, and possessing a piquant sense of humour savouring of Rabelais and at times of Juvenal, he had an enormous acquaintance with people and knowledge of their ways. His was the soul of a poet and a nature-lover, for although he elected to live in the centre of the city, his heart often sang the beauties of his native Hawkesbury and the rural accomplishments of his boyhood friends.

He has been termed a Victorian, but I like to think of him as a figure of the Restoration. His type and temperament were frequently encountered in the Ireland of my youth, a circumstance which may have occasioned the observation that, in that country, the inevitable never happened, but the unexpected invariably. He was wont to refer to himself jocularly as a "pagan", but I doubt if there are many greater Christians. And, he had that great gift of nobility of character—he was equally at home with the poorest as with the greatest.

Many disappointments overtook him in the last few years; the death of his old friend "Paddy" Moran caused him sore distress, and that of his lifelong retainer and comrade-in-arms, John Ferguson, Health Officer of Burwood, dealt him a severe blow. Apart from these, his health had begun to fail during the past year and even the attention of his friends and of his devoted helper and servitor for thirty years, Lew Solomon, failed to rally him when the final tragedy overwhelmed his fighting spirit.

And so a truly great gentleman has passed away, and Sydney loses an outstanding personality, the medical profession a noble son, and many of us our most beloved friend and counsellor. No more shall we see that familiar, long, lanky figure, the aquiline features, and the battered old hat—the *condottiere* of Phillip Street. *Atque in perpetuum frater Piero, ave atque vale!*

Dr. A. G. Butler writes: Like his father—whom he intensely, even jealously, admired—Piero Flaschi's temperament was positive and intense, even egocentric, his character forthright to crudity; but never within my knowledge of him was he insincere or egotistic. His worship, if one can apply so self-conscious a term to Piero Flaschi, was scientific and clinical enthusiasm and honesty.

My first contact with Piero was characteristic, physically and mentally "arresting". It was in 1910, in the passage-way of the pathology department of the University of Sydney where I was working with D. A. Welsh and Froude Flashman. Late one evening after work (if I remember aright) I ran into Piero, who carried on his back, imperfectly covered, a huge human leg amputated that day by his father for malignant disease. So valuable a specimen must be got to the museum at once by hook or crook; and with Piero to think was to act—"regardless"! This same enthusiasm and regardlessness characterized (in my experience) his reaction to life in all its aspects and emergencies, intellectual and emotional.

I was at the Australasian Medical Congress in Auckland in 1914, where Piero and his experimental dogs shared with Truby King and James Barrett the limelight of that remarkable congress. And (believe it or not) those same dogs (or their successors) and Piero were the cause of a "No. 1" administrative ruction when, with his "surgical team" consisting of two personal assistants and himself complete with equipment and the dogs, in a lorry, Piero presented himself to the officer in command of a British casualty clearing station for work; occasion, the German breakthrough on the Somme in 1918. I myself had Piero under me at Number 3 Australian General Hospital at Abbeville. He had the reputation of being difficult to handle. I had no difficulty whatever—I knew my Piero. Give him three men's work and a free hand, and one could put Piero and the work out of one's mind.

I had only occasional contact with Piero after the war. His outlook social and professional (and his speech) were greatly influenced—perhaps not entirely unconsciously—by his years in America. But in my appreciation of him he was first, foremost and all the time Australian. Of his professional and social life I have nothing to record. Of this, however, I am sure: that while there might be intransigence, even ruthlessness, there would be no humbug; and there would be an inexorable adherence to truth; and withal an abiding loyalty to his ideals, and unswerving obedience to the call of duty as he conceived it.

"Γνωθι σεαυτόν"—"know thyself"—is the first and perhaps the most significant legacy to us of Greek philosophy; and like every worthwhile advice, it is hard to achieve. And if in oneself, how much more in one's fellows. For right or wrong this is my impression of my friend Piero Flaschi: and it is not a bad impression to have left behind!

PERCY DEAN BRAY.

We regret to announce the death of Dr. Percy Dean Bray, which occurred on August 21, 1948, at Sydney.

### Notice.

ADVICE has been received from the Criminal Investigation Branch of the New South Wales Police Department that one stainless steel Green's eye trephine, in a green case about six and a half inches by two and a half inches in size, was stolen from a medical practitioner's motor-car in a driveway off Castlereagh Street, Sydney, on July 28, 1948. Other articles stolen at the same time were two small scissors-type eye instruments, two small trephine blades, one yellow pigskin kitbag with zip fastener and two white coats. The trephine is particularly valued and difficult to replace, and it is requested that any practitioner to whom it may be offered for sale should communicate with the Criminal Investigation Branch, Sydney (telephone B 030, extension 320), or with the local police.

### Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Nordstrom, Leslie Leonard, M.B., B.S., 1947 (Univ. Sydney), 26, Burnell Street, Five Dock.  
Beveridge, John, M.B., B.S., 1947 (Univ. Sydney), 67, Milson Road, Cremorne.  
Crowther, Geoffrey Earl, M.B., B.S., 1936 (Univ. Sydney), 9, Springfield Avenue, Darlinghurst.  
Mack, Joseph McDoull, M.B., 1938 (Univ. Sydney), 17, Dural Street, Hornsby.

The undermentioned have applied for election as members of the South Australian Branch of the British Medical Association:

Hicks, Neil Dennis, M.B., B.S., 1948 (Univ. Adelaide), Royal Adelaide Hospital, Adelaide.  
Blackburn, Suzanne Burton, M.B., B.S., 1948 (Univ. Adelaide), Royal Adelaide Hospital, Adelaide.  
Peters, Brian Harry, M.B., B.S., 1948 (Univ. Adelaide), Royal Adelaide Hospital, Adelaide.  
Duguid, William George, M.B., B.S., 1948 (Univ. Adelaide), Royal Adelaide Hospital, Adelaide.  
Moffin, Lionel Hugh, M.B., B.S., 1948 (Univ. Adelaide), Royal Perth Hospital, Perth.  
Simpson, Frederick William, M.B., B.S., 1934 (Univ. Adelaide), Oxford, England.  
de Bruin, Arthur James, M.B., B.S., 1945 (Ceylon), Adelaide.  
Robertson, Thomas Ernest Guyatt, M.B., B.S., 1939 (Univ. Melbourne), F.R.A.C.S., 1947, Mt. Gambler.

The following additional qualifications have been registered:

Salter, Douglas Munro, Adelaide, D.P.M., 1947 (Univ. Melbourne).  
Chinner, Melville Ernest, Adelaide, F.R.A.C.P., 1947.  
Flaum, Ernst, Adelaide, M.D., 1944 (Univ. Adelaide).  
Pellew, Leonard James Ternouth, Adelaide, F.R.A.C.S., 1948.

### Medical Appointments.

Dr. W. C. Day has been appointed quarantine officer, Urangan, in pursuance of the provisions of the Quarantine Act, 1908-1947, of Queensland.

### Diary for the Month.

- SEPT. 7.—New South Wales Branch, B.M.A.: Organization and Science Committee.  
SEPT. 9.—Victorian Branch, B.M.A.: Organization Subcommittee.  
SEPT. 10.—Queensland Branch, B.M.A.: Council Meeting.  
SEPT. 13.—Victorian Branch, B.M.A.: Finance, House and Library Subcommittee.  
SEPT. 14.—New South Wales Branch, B.M.A.: Executive and Finance Committee.  
SEPT. 15.—Western Australian Branch, B.M.A.: General Meeting.  
SEPT. 16.—Victorian Branch, B.M.A.: Executive Meeting.  
SEPT. 21.—New South Wales Branch, B.M.A.: Medical Politics Committee.  
SEPT. 22.—Victorian Branch, B.M.A.: Council Meeting.  
SEPT. 23.—New South Wales Branch, B.M.A.: Clinical Meeting.  
SEPT. 24.—Queensland Branch, B.M.A.: Council Meeting.  
SEPT. 28.—New South Wales Branch, B.M.A.: Ethics Committee.  
SEPT. 30.—New South Wales Branch, B.M.A.: Branch Meeting.

### Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

**New South Wales Branch** (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phoenix Mutual Provident Society.

**Victorian Branch** (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

**Queensland Branch** (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute; Brisbane City Council (Medical Officer of Health). Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

**South Australian Branch** (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

**Western Australian Branch** (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

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